HRS DOCUMENTATION RECORD COVER SHEET

Name of Site: Riverside Industrial Park

EPA ID No.: NJSFN0204232 (Ref. 20, p. 1)

<u>Contact Persons</u>

Documentation Record: Ildefonso Acosta and James Desir
Region 2 Acting NPL Coordinator
U.S. Environmental Protection Agency Region 2
290 Broadway
New York, New York 10007
(212) 637-4344

<u>Pathways, Components, or Threats Not Scored</u>

The surface water migration pathway was the only pathway scored.

<u>Ground Water Migration Pathway</u>

The ground water pathway was not scored. The surface water migration pathway score was sufficient to list the site. Although the ground water pathway was not scored there are targets potentially associated with the ground water pathway, including four possibly active public drinking water supply wells within a 4-mile radius of Riverside Industrial Park (Ref. 21).

<u>Soil Exposure Pathway</u>

The soil exposure pathway was not scored. The surface water migration pathway score was sufficient to list the site. Although the soil exposure pathway was not scored, there is known soil contamination at the site has been identified and may pose threat to nearby human health and the environment.

<u>Air Migration Pathway</u>

The air migration pathway was not scored. The surface water migration pathway score was sufficient to list the site. Although the air migration pathway was not scored, a potential threat to individuals may exist based on a contaminant air release identified at the site.

HRS DOCUMENTATION RECORD

Name of Site: Riverside Industrial Park **Date Prepared:** September 2012

EPA Region: Region 2

Street Address of Site*: 29 Riverside Avenue

City, County, State, Zip Code: Newark, Essex County, New Jersey 07104

General Location in the State: Northeast section of the State

Topographic Map: Orange, New Jersey

Latitude: 40.765722°North **Longitude:** -74.159084°West

The site coordinates correspond with the northeast corner of Building 7 (Ref. 4; Ref. 7, p. 55; Figure 2).

References: 3, 4 and 20

* The street address, coordinates, and contaminant locations presented in this Hazard Ranking System (HRS) documentation record identify the general area the site is located. They represent one or more locations U.S. Environmental Protection Agency (EPA) considers to be part of the site based on the screening information EPA used to evaluate the site for the National Priorities List (NPL) listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

	Score
Ground Water Migration Pathway:	0
Surface Water Migration Pathway:	100
Soil Exposure Pathway:	0
Air Migration Pathway:	0

HAZARD RANKING SYSTEM SITE SCORE: 50.00

WORKSHEET FOR COMPUTING HRS SITE SCORE

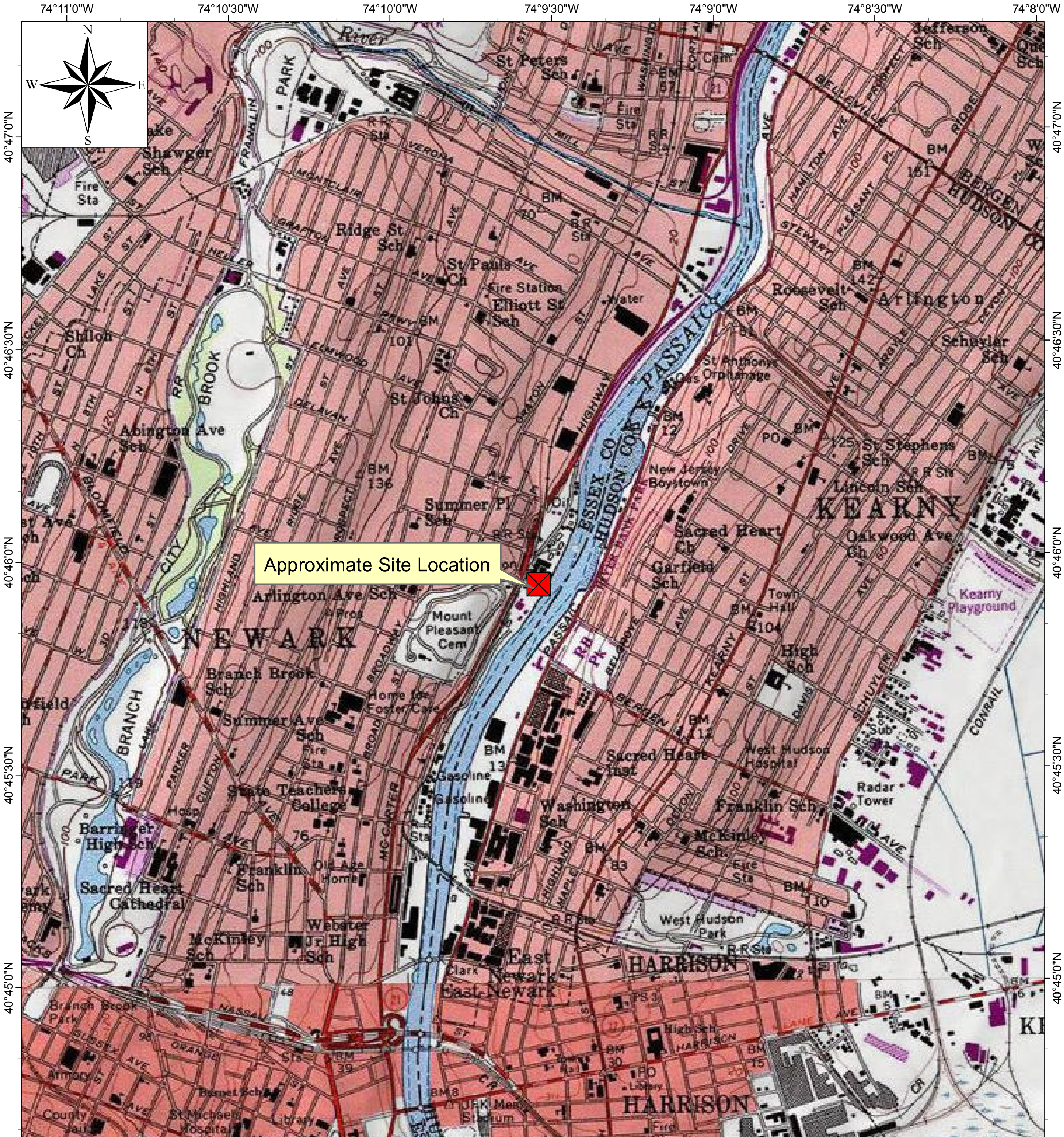
		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw})	Not Scored	Not Scored
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	100.00	10,000
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	Not Scored	Not Scored
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	100.00	10,000
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	Not Scored	Not Scored
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	Not Scored	Not Scored
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		10,000
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root	50.00	

HRS TABLE 4-1 -Surface Water Overland/Flood Migration Component Scoresheet

Factor Categories and Factors	Maximum Value	Value Assigned
Drinking Water Threat		
Likelihood of Release:		
1. Observed Release	550	550
2. Potential to Release by Overland Flow:		
2a. Containment	10	_
2b. Runoff	25	_
2c. Distance to Surface Water	25	_
2d. Potential to Release by Overland Flow (lines 2a x [2b + 2c])	500	_
3. Potential to Release by Flood:		
3a. Containment (Flood)	10	_
3b. Flood Frequency	50	_
3c. Potential to Release by Flood (lines 3a x 3b)	500	_
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	_
5. Likelihood of Release (higher of lines 1 and 4)	550	550
Waste Characteristics:		
6. Toxicity/Persistence	(a)	NS
7. Hazardous Waste Quantity	(a)	NS
8. Waste Characteristics	100	NS
Targets:		
9. Nearest Intake	50	NS
10. Population:		
10a. Level I Concentrations	(b)	_
10b. Level II Concentrations	(b)	_
10c. Potential Contamination	(b)	_
10d. Population (lines 10a + 10b + 10c)	(b)	_
11. Resources	5	_
12. Targets (lines 9 + 10d + 11)	(b)	0
Drinking Water Threat Score:		
13.Drinking Water Threat Score ([lines 5 x 8 x 12])/82,500, subject to a maximum of 100)	100	NS
Human Food Chain Threat		
Likelihood of Release:		
14. Likelihood of Release (same value as line 5)	550	550
Waste Characteristics:		
15. Toxicity/Persistence/Bioaccumulation	(a)	5×10^8
16. Hazardous Waste Quantity	(a)	100
17. Waste Characteristics	1,000	320

Factor Categories and Factors	Maximum Value	Value Assigned
Targets:		
18. Food Chain Individual	50	20
19. Population:		
19a. Level I Concentrations	(b)	NS
19b. Level II Concentrations	(b)	NS
19c. Potential Human Food Chain Contamination	(b)	0.00003
19d. Population (lines 19a + 19b + 19c)	(b)	0.00003
20. Targets (lines 18 + 19d)	(b)	20.00003
Human Food Chain Threat Score:		
21. Human Food Chain Threat Score ([lines 14 x 17 x 20]/82,500, subject to a maximum of 100)	100	42.66
Environmental Threat		
Likelihood of Release:		
22. Likelihood of Release (same value as line 5)	550	550
23. Ecosystem Toxicity/Persistence/Bioaccumulation	(a)	5×10^8
24. Hazardous Waste Quantity	(a)	100
25. Waste Characteristics	1,000	320
Targets:		
26. Sensitive Environments:		
26a. Level I Concentrations	(b)	0
26b. Level II Concentrations	(b)	180
26c. Potential Contamination	(b)	0
26d. Sensitive Environments (lines 26a + 26b + 26c)	(b)	180
27. Targets (value from 26d)	(b)	180
Environmental Threat Score:		
28. Environmental Threat Score ([lines 22 x 25 x 27]/82,500, subject to a maximum of 60)	60	60
Surface Water Overland/Flood Migration Component Score For A Watershed		
29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100)	100	100
Surface Water Overland/Flood Migration Component Score		
30. Component Score (S_{of})[c] (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100	100

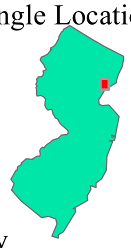
[a]Maximum value applies to waste characteristics category.
[b]Maximum value not applicable.
[c]Do not round to nearest integer.



Source: Modified from USGS 7.5-Minute Series Topographic Quadrangles: Elizabeth, New Jersey, 1967, Photorevised 1981; Orange, New Jersey, 1955, Photorevised 1981

0 0.25 0.5 Miles

Quadrangle Location =



New Jersey

Riverside Avenue
Newark, Essex County, New Jersey

Figure 1
Site Location Map

Task No. 9004L080115.003
EPA Contract No. EP-S7-06-01

TETRA TECH

Date Saved: 12/19/2011 1:20:50 PM User: joel.peters Path: S:\CADD\I\9004\L080115003\TTEMI-I100178_Riverside_Avenue\mxd\TripReport\Riverside_1.mxd

Source: Modified from Bing Maps Hybrid.

0 75 150 Feet

Quadrangle Location =

New Jersey

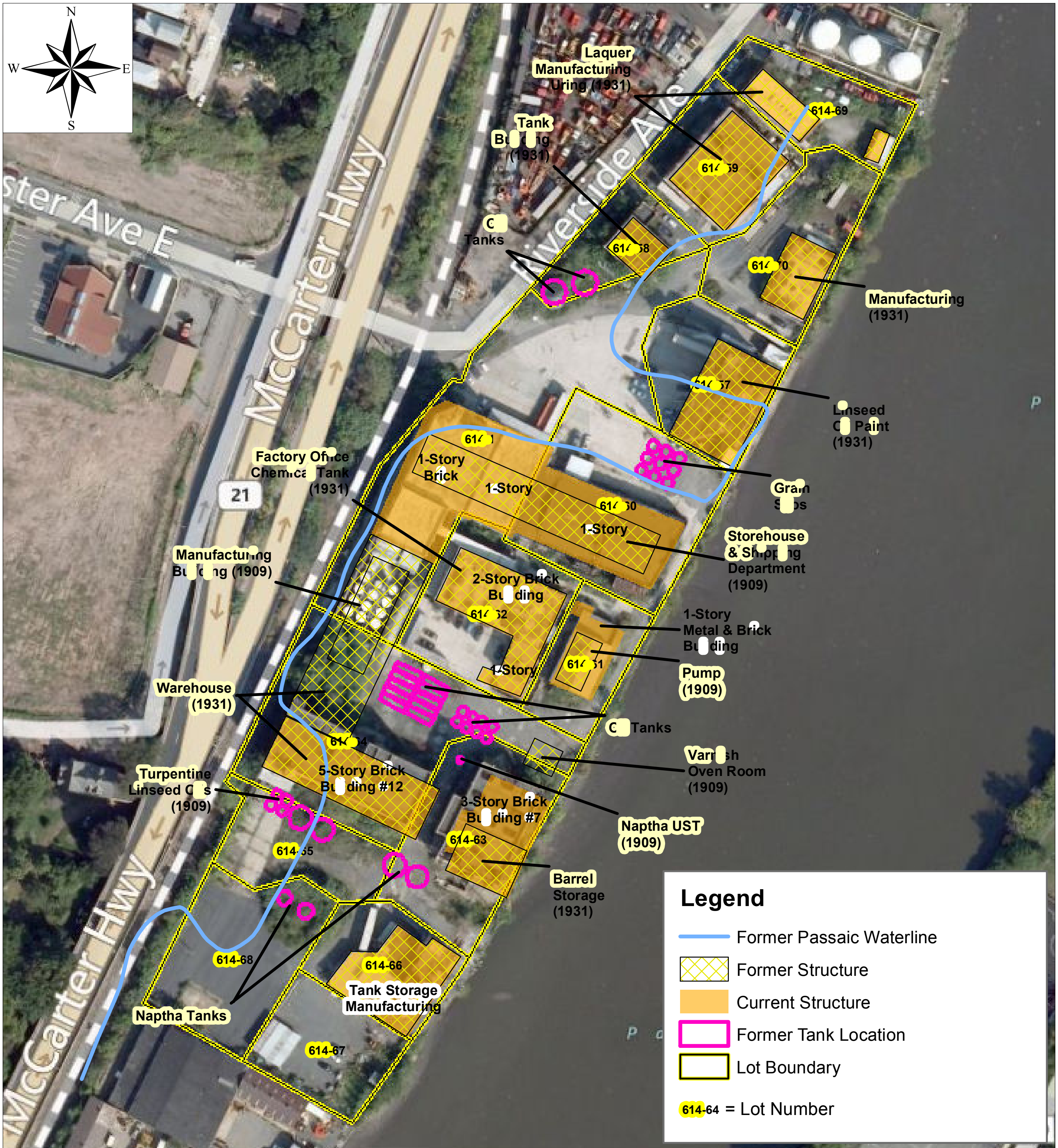
Riverside Avenue
Newark, Essex County, New Jersey

Figure 2
Site Layout

Task No. 9004L080115.003
EPA Contract No. EP-S7-06-01

TETRA TECH

Date: 3/13/2012 User: joel.peters Path: S:\CADD\I\9004\L080115003\TTEMI-I100178_Riverside_Avenue\mxd\TripReport\Riverside_2_SiteLayout.mxd



Source: Modified from Bing Maps Hybrid.

0 75 150
Feet

Quadrangle Location = ■

New Jersey

Riverside Avenue
Newark, Essex County, New Jersey

Figure 3
Historic Features

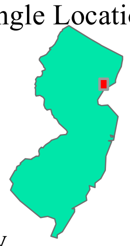
Task No. 9004L080115.003
EPA Contract No. EP-S7-06-01

TETRA TECH

Date: 3/13/2012 User: joel.peters Path: S:\CADD\I\9004\L080115003\TTEMI-I100178_Riverside_Avenue\mxd\TripReport\Riverside_3_Historic.mxd

Source: Modified from Bing Maps Hybrid.

Quadrangle Location =



New Jersey

Riverside Avenue
Newark, Essex County, New Jersey

Figure 4
Sampling Location Map

Task No. 9004L080115.003
EPA Contract No. EP-S7-06-01

TETRA TECH

Date: 3/13/2012 User: joel.peters Path: S:\CADD\I\9004\L080115003\TTEMI-I100178_Riverside_Avenue\mxd\TripReport\Riverside_4_SamplingLocations.mxd

REFERENCES

Ref.
No. Description of the Reference

1. U.S. Environmental Protection Agency. (EPA). Hazard Ranking System (HRS): Final Rule. Title 40 of the *Code of Federal Register* (CFR), Part 300, Federal Register, Volume 55, No. 241. December 14, 1990. 138 pages. (http://www.epa.gov/superfund/sites/npl/hrsres/index.htm#HRS Rule).

2. EPA. Superfund Chemical Data Matrix. March 31, 2012. 16 pages. A complete copy of SCDM is available at http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

3. U.S. Geological Survey. Topographic Map for Orange, New Jersey. 1955. Photorevised 1981. 1 sheet.

4. Tetra Tech EM Inc. (Tetra Tech). Project Note for the 29 Riverside Avenue Property. Subject: Latitude and Longitude of the 29 Riverside Avenue Property using Google Earth©. March 15, 2010. 1 page.

5. Tetra Tech. 15-Mile Downstream Target Distance Limit – Riverside Avenue Site. March 17, 2010. 1 sheet.

6. Weston Solutions, Inc. Preliminary Assessment Report. 1700-1712 and 1702 -1716 McCarter Highway, Newark, New Jersey. May 2009. 99 pages.

7. Birdsall Services Group Inc./PMK Group. Draft Site Inspection Report. Volume I. October 16, 2009. 139 pages.

8. National Oceanic and Atmospheric Administration (NOAA). Letter Regarding Passaic River. From Reyhan Mehran, Regional Resource Coordinator, NOAA Office of Response and Restoration. To Ms. Jan Hagiwara, EPA. February 4, 2010. 2 pages.

9. EPA. National Estuary Program – New York-New Jersey Harbor Estuary. Accessed on March 15, 2010. On-line Address: http://www.epa.gov/owow/estuaries/programs/hep.html. 2 pages.

10. Desvousges, William H., Jason C. Kinnell, and others. Passaic River Study Area Creel/Angler Survey: Data Report. September 27, 2001. 334 pages.

11. Tetra Tech. Project Note Regarding Discharge into Passaic River from the Riverside Avenue Site. Prepared by Alicia Shultz, HRS Specialist. March 10, 2010. 3 pages.

12. Upstate Laboratories. Analytical Report. Lab Order: U0911296. Project: 29 Riverside Avenue Site. November 25, 2009. 9 pages.

13. EPA. Photographs of Tanks Located in Building 12. November 11, 2009. 3 pages.

14. New Jersey Department of Environmental Protection (NJDEP). Bureau of Emergency Response. Emergency Authorization Request. November 17, 2009. 21 pages.

REFERENCES (Continued)

15. Tetra Tech. Record of Telephone Conversation Regarding the Riverside Avenue Site. From Alicia Shultz, HRS Specialist. To David Beckman, Senior Associate, Birdsall Services Group. March 15, 2010. 1 page.

16. Tetra Tech. Record of Telephone Conversation Regarding the Riverside Avenue Site. From Alicia Shultz, HRS Specialist. To Dan Kowalski, Response Manager, AECOM. March 10, 2010. 1 page.

17. Malcolm Pirnie, Inc. Conceptual Site Model, Lower Passaic River Restoration Project. August 2005. 29 pages.

18. EPA. Notes from Regional Decision Team (RDT) Meeting. December 16, 2009. 1 page.

19. EPA. Record of Telephone Conversation Regarding Fish Closure for Passaic Fishery. From Jan Hagiwara, Site Assessment Manager. To Dr. Gary Buchanan, Manager, New Jersey Department of Environmental Protection Office of Science. January 14, 2010. 1 page.

20. EPA. Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), Riverside Avenue Site. March 11, 2010. 2 pages.

21. EPA. Electronic Mail Regarding Riverside Avenue Site, Ground Water Use. From Jan Hagiwara, Site Assessment Manager. To Alicia Shultz, Tetra Tech, HRS Specialist. March 8, 2010. 2 pages.

22. EPA. CERCLIS, Facility Detail Report, Riverside Avenue Site. March 15, 2010. 1 page.

23. Reference number reserved

24. EPA Region 2. Inorganic Data Review Narrative. Case No.: 41905. Site: Riverside Avenue Site. SDG: MB00R0. Undated. 4 pages.

25. Reference number reserved

26. EPA Region 2. Inorganic Data Review Narrative. Case No.: 41905. Site: Riverside Avenue Site. SDG: MB00T7. Undated. 3 pages.

27. EPA. Pollution Reports (POLREP) for Riverside Avenue. November 13, 2009, through February 28, 2012. 33 pages. (On-line address: http://www.epaosc.org/site/sitrep_list.aspx?site_id=5606).

28. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00RA. B00T7. Analysis: Volatile Organic Analysis (VOA). January 17, 2012. 11 pages.

REFERENCES (Continued)

29. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00R0. Analysis: VOA. January 17, 2012. 8 pages.

30. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00R6. B00P4. Analysis: VOA. January 11, 2012. 12 pages.

31. Tetra Tech. Sampling and Analysis Plan for the Riverside Avenue Site, Newark, Essex County, New Jersey. EPA Contract No. EP-S7-06-01. May 31, 2011. 228 pages.

32. Tetra Tech. Final Sampling Trip Report, Riverside Avenue Site, Newark, New Jersey. December 21, 2011. 174 pages.

33. EPA CLP Electronic Deliverable Riverside Avenue. 142118.Y41905.EPW11030.B00R0. Undated. 62 pages.

34. EPA CLP Electronic Deliverable Riverside Avenue. Y41905.EPW09040.MB00R0. Undated. 11 pages.

35. EPA CLP Electronic Deliverable Riverside Avenue. Y41905.EPW09040.MB00T7. Undated. 15 pages.

36. EPA CLP Electronic Deliverable Riverside Avenue. Y41905.EPW11030.B00R6. Undated. 27 pages.

37. EPA CLP Electronic Deliverable Riverside Avenue. Y41905.EPW11030.B00R1. Undated. 65 pages.

38. Lockheed Martin. Memorandum Regarding Trip Report 29 Riverside Site. From Martin Ebel, SERAS Task Leader. To Don Bussey, EPA/ERT Work Assignment Manager. November 9, 2010. 140 pages.

39. EPA CLP Electronic Deliverable Riverside Avenue. Y41905.EPW11030.B00T7. Undated. 48 pages.

40. Tetra Tech. Teleconference Summary. Sample Quantitation Limits. Prepared by Alicia Shultz, HRS Specialist. February 10, 2011. 2 pages.

41. EPA Region 2. Inorganic Data Review Narrative. Case No.: 41905. Site: Riverside Avenue Site. SDG: MB00R0. Undated. 4 pages.

42. EPA CLP Region 2. Sample Summary Report. Case No.: 41905. Contract: EPW09040. Lab Code: SENTIN. SDG: MB00R0. January 9, 2012. 49 pages.

43. Whitman. 29-75 Riverside Avenue. Figures and Analytical Data for Lots 62, 66, and 67. Figures dated March 2011 and June 2011. Analytical Data from 2008, 2009, and 2011. 23 pages.

REFERENCES (Continued)

44. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00R6, B00P4. Analysis: VOA. January 11, 2012. 12 pages.

45. Reference number reserved

46. EPA CLP Region 2. Sample Summary Report. Case No.: 41905. Contract: EPW11030. Lab Code: CHEM. SDG: B00T7. January 18, 2012. 116 pages.

47. EPA CLP Region 2. Sample Summary Report. Case No.: 41905. Contract: EPW11030. Lab Code: CHEM. SDG: B00R6. January 17, 2012. 61 pages.

48. EPA CLP Region 2. Sample Summary Report. Case No.: 41905. Contract: EPW11030. Lab Code: CHEM. SDG: B00R0. January 17, 2012. 88 pages.

49. EPA CLP Region 2. Sample Summary Report. Case No.: 41905. Contract: EPW11030. Lab Code: CHEM. SDG: B00R1. January 17, 2012. 160 pages.

50. EPA Region 2. Inorganic Data Review Narrative. Case No.: 41905. Site: Riverside Avenue Site. SDG: MB00P4. Undated. 4 pages.

51. EPA Region 2. Inorganic Data Review Narrative. Case No.: 41905. Site: Riverside Avenue Site. SDG: MB00T7. Undated. 3 pages.

52. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00P4. Analysis: BNA. January 11, 2012. 5 pages.

53. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00P4. Analysis: PCB. January 11, 2012. 4 pages.

54. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00R0. Analysis: VOA. January 17, 2012. 8 pages.

55. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00R1, B00T7. Analysis: BNA. January 17, 2012. 9 pages.

56. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00R1, B00T7. Analysis: PCB. January 17, 2012. 7 pages.

57. EPA Region 2. Functional Guidelines for Evaluating Organic Analysis. Case No.: 41905. Site: Riverside Avenue Site. SDG: B00R1, B00T7. Analysis: VOA. January 17, 2012. 11 pages.

58. Reference number reserved

REFERENCES (Continued)

59. Tetra Tech. Quality Assurance Project Plan for the Riverside Avenue Site, Newark, New Jersey. January 24, 2011. 82 pages.

60. Reference number reserved

61. Sanborn Maps. 1909, 1931, 1950. 9 pages.

62. Reference number reserved

63. Agency for Toxic Substances and Disease Registry. Total Petroleum Hydrocarbons. 1 page. Accessed On March 12, 2012. On-line address: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=75

64. Tetra Tech. Revised Draft Trip Report, Riverside Avenue Site, Newark, New Jersey. EPA Contract No. EP-S7-06-01. September 3, 2010. 145 pages.

65. NJDEP. 2012. Fish Consumption Advisories – Statewide Estuarine & Marine Waters. Accessed on the internet at www.state.nj.us/dep/dsr/fishadvisories/statewide.htm on July 18, 2012. 3 pages.

66. U.S. Geologic Society (USGS). USGS 01389890 Passaic River Flow Rate Data. Accessed on the internet at http://waterdata.usgs.gov/usa/nwis/uv?01389890 on May 23, 2012. 3 pages.

67. EPA. 2011. Chains of Custody (COC) for Case No. 41905. November and December 2011. 12 pages.

68. NJDEP. 2012. Electronic mail: Information on Fish/Crab Consumption. July 11. 2 pages.

69. Science of the Total Environment. 2011. “Consumption patterns and risk assessment of crab consumers from the Newark Bay Complex, New Jersey, USA.” July 5. 9 pages.

70. Tetra Tech. 2012. Riverside Avenue Site: Probable Points of Entry. July 18. 1 page.

71. NJDEP. 1987. Division of Waste Management Inspection Report at Frey Industries Inc. (Formerly Jobar Packaging). April 2. 11 pages.

72. Tetra Tech. 2012. Riverside Avenue Site: Flooding Documentation. July 19. 1 page.

73. Tetra Tech. 2012. Source 2: Area of Soil Contamination Measurement. July 19. 1 page.

74. Tetra Tech. 2012. Surface Water Migration Pathway Target Distance with Tidal Influence. July 23. 1 page.

75. Reference number reserved

76. EPA. 2012. Electronic mail from Jan Hagiwara, EPA, to Kumud Pyakuryal, Tetra Tech: Three published articles documenting fish consumption on the lower Passaic River. July 9. 11 pages.

77. EPA. 2012. Electronic mail from Jan Hagiwara, EPA, to Kumud Pyakuryal, Tetra Tech. Fish Consumption Surveys. July 12. 19 pages.

78. New York City Department of Environmental Protection. 2011. Harbor-Wide Water Quality Monitoring Report for the New York – New Jersey Harbor Estuary. On-line address: http://www.harborestuary.org/reports/HarborWideSurveyReport-2011.pdf. Accessed in July 2012. 52 pages.

79. New York – New Jersey Harbor Estuary Program. 2009. Comprehensive Conservation and Management Plan Actions: Habitat. On-line address: http://www.nan.usace.army.mil/harbor/crp/pdf/vol1.pdf. Accessed in July 2012. 16 pages.

80. U.S. Army Corps of Engineers (USACE). 2009. Hudson-Raritan Estuary Comprehensive Restoration Plan (Draft). On-line address: http://www.nan.usace.army.mil/harbor/crp/pdf/vol1.pdf. Accessed in July 2012. 169 pages.

81. USACE. 2007. Target Ecosystem Characteristics for the Hudson Raritan Estuary: Technical Guidance for Developing a Comprehensive Ecosystem Restoration Plan. On-line address: http://www.harborestuary.org/reports/TECReport07.pdf. Accessed in July 2012. 112 pages.

82. New York – New Jersey Harbor Estuary Program. Date Unknown. Fact Sheet. On-line address: http://www.harborestuary.org/pdf/hep_what_is.pdf. Accessed in July 2012. 4 pages.

83. U.S. Fish and Wildlife Service. 1996. Regionally Significant Habitats and Habitat Complexes of the New York Bight Watershed: New York – New Jersey Harbor/Urban Core Overview. 48 pages.

84. EPA. 2012 Record of Phone Conversation. From Jan Hagiwara, Site Assessment Manager, EPA, to Eric Daly, On-Scene Coordinator, EPA. July 20, 2012. (Attachment: Diagram and photographs of water flow at 29 Riverside Avenue). 6 pages.

85. NJDEP. 2012. Water Monitoring and Standards: Surface Water Quality Standards. Accessed on the internet at http://www.nj.gov/dep/wms/bwqsa/swqs.htm. Accessed in July 2012. 4 pages.

86. EPA. 2012. Memo to File: Presence of break walls at river boundary of site, 29 Riverside Avenue, Newark, New Jersey. July 25. 1 page.

INTRODUCTION

As presented in the HRS documentation record, the site encompasses a release of hazardous substances from tanks, located on a former paint and varnish manufacturing facility property and other industrial operations at Riverside Industrial Park, to the adjacent Passaic River and contaminated soils throughout the property. These releases are associated with present and past site activities. The EPA's Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) database identifies 29 Riverside Avenue as the physical address associated with the site (Ref. 20; Ref. 22). The site inspection (SI) report locates the property as being located at 1700-1712 McCarter Highway, Block 64, Lots 63 and 64, as shown on Plate 1, page 17 of Reference 7 (Ref. 7, pp. 4, 17). An assessment of the Site addresses listed in CERCLIS and the SI indicated that both information sources refer to the same property (Ref. 7, p. 51; Ref. 22).

The property was formerly used for paint and varnish manufacturing; it is currently partially vacant, but includes two multi-story concrete buildings identified as Buildings 7 and 12 (Ref. 7, pp. 6, 52). A layout of the property is shown on Plate 2 in Reference 7, page. 18. The tanks that released to the Passaic River are located in Building 12 (Ref. 11, pp. 1, 3; Ref. 13; Ref. 15; Ref. 16; Ref. 18). Tanks in the basement of Building 12 were connected to a hose that was connected to the sewer system eventually releasing to the Passaic River (Ref. 15, p.1).

On October 29, 2009, New Jersey Department of Environmental Protection (NJDEP) responded to a reported oil spill (while called oil, it does not refer to petroleum products only) into the Passaic River from Riverside Industrial Park. Contents were released from tanks located in the basement of a building on the property into the river via underground pipes—the source of the spill was traced back to two tanks in the basement of Building 12 at the abandoned paint manufacturing facility then owned by the City of Newark through tax foreclosure (Ref. 11, pp. 1, 3; Ref. 14, pp. 2, 3; Ref. 16; Ref. 18). Black viscous material was observed in the Passaic River by the embankment at 29 Riverside Avenue, extending approximately 0.25 mile upstream and downstream from that location. A sample of the black viscous material was collected from the river and screened using the Haz-Cat Chemical Identification System during the response; it tested positive for chlorinated solvents (Ref. 14, pp. 2, 3). The source of the spill was identified at low tide when a pipe containing the spill was exposed (Ref. 14, p. 8). The pipe was sealed, stopping the release (Ref. 14, pp. 14, 15, 16). After the release was stopped, oil continued to leach into the river from ground water and along the perimeter of the pipe (Ref. 14, p. 15). The pipe that discharged into the Passaic River was traced to a catch basin. When the cover of the catch basin was removed, the oily substance in the discharge was observed in the basin; a pipe exiting Building 12 was observed to discharge into the basin. The discharge from the Building 12 pipe resembled the discharge observed into the Passaic River. The pipe was traced to two connected tanks in the basement of Building 12 (Ref. 11, pp. 1, 3).

After conducting investigations of the discharge point at Riverside Industrial Park, EPA initiated an emergency removal action to secure and remove the oil from the source of discharge. On November 11, 2009, the EPA Emergency and Rapid Response Services (ERRS) contractor mobilized to Riverside Industrial Park to conduct removal activities. ERRS contractors plugged the sewer lines and secured the tanks that had been the source of the immediate release in order to prevent further discharge into the Passaic River. The tanks were directly connected to a sewer line in the basement of Building 12. Access to the basement was limited because the stairway to the area was determined possibly structurally unsound. The connection to the sewer line was made via a hose specifically sized and adapted for the purpose of discharging to the sewer, and the tank valves were opened. Based on the field investigation during removal activities, contents of the two basement tanks appeared to have been intentionally set up to discharge into the sewer; when the valve was closed, the release to the Passaic River ceased (Ref. 11, pp. 1, 3; Ref. 13; Ref. 15; Ref. 16; Ref. 18).

Based on the available information, the contamination from the source was visually documented entering the river; therefore, the discharge to the Passaic River is documented as an observed release by direct observation (Ref. 1, Sections 2.3 and 4.1.2.1.1). The discharge is evaluated as Source 1 in this HRS documentation record. Analysis of a sample of the tank contents revealed the presence of barium, mercury, and dimethylphenol (Ref. 12, p. 3). The portion of the Passaic River where the observed release is documented is a migratory pathway and feeding area for anadromous fish species, and is part of the New York-New Jersey Harbor Estuary (Ref. 8, pp. 2; 9, pp. 1-2). An EPA representative familiar with the lower Passaic fishery located along the former paint and varnish manufacturing facility at Riverside Industrial Park stated that this fishery has been closed since the 1980s due to dioxin and PCB contamination. Specifically, the New Jersey Department of Environmental Protection (NJDEP) issued an emergency rule on December 15, 1982 due to PCBs (Ref. 5; Ref. 19, p. 1). However, a comprehensive 2001 study was published with the objective of collecting information on area anglers and consumption patterns to support calculation of ingestion rates and risks documented the innate nature of the Passaic River, including the river segment in the immediate vicinity of the Riverside Industrial Park site, as a fishery for human consumption (Ref. 5; Ref. 10, pp. 9, 11, 33, 38, 44, 55-57). The NJDEP 2012 Fish Consumption Advisory for Tidal Passaic River recommends public to not consume fish or crab caught here (Ref. 65, pp. 1-2). Other publications and sources continue to indicate that the segment of the Passaic River adjacent to the site is used as a fishery for consumption purposes (Ref. 68, pp. 1-2; Ref. 69, pp. 1-2, 4; Ref. 76, pp. 3-11).

A second source, contaminated soil, was identified on the abandoned paint and varnish manufacturing facility location during a December 2011 investigation by the EPA Region 7 Superfund Technical Assistance and Response Team (START) (Ref. 32, pp. 1, 3, 7). The investigation included collection of surface and subsurface soil and ground water samples from 15 sampling locations, including three background sampling locations (Ref. 32, pp. 3, 7, 10, 11). The contamination includes metals, semi-volatile organic compounds (SVOC), volatile organic compounds (VOC), and polychlorinated biphenyls (PCB) (Ref 32. P. 17). Section 2.4 of this HRS documentation record for Source 2 provides documentation of the hazardous substances and concentrations detected in the soil samples.

Site History

The initial investigative actions at the site were in response to a reported spill associated with Source 1 and the focus remained in addressing its release to the Passaic River. However, the Riverside Industrial Park entails a wider area of known soil contamination associated with Source 2; an estimated area of observed contamination is 130,172 square feet (Ref. 32, pp. 17, 23-31).

Most of the historic information pertained to two parcels (614-61 and 62), specifically collected by the City of Newark, New Jersey (Ref. 6; 7). The City obtained the property in 1993 through foreclosure from Industrial Development Association and Industrial Development Corporation. The property includes a three-story building known as Building No. 7, a five-story building known as Building No. 12, and a former concrete building foundation located adjacent to Building No. 7. The property is bordered to the north by Chemical Compounds, Inc., and a vacant lot owned by the City of Newark; to the east by the Passaic River; to the south by Chemical Compounds, Inc., and a vacant lot; and to the west by railroad tracks (Ref. 6, p. 21). Prior to 1993, the property was owned by Frey Industries, part of an industrial complex; Central Chemical also reportedly had operated on the Site at some earlier time (Ref. 6, p. 23).

Based on fire insurance maps, prior to 1909 a water line that may have been covered by the Passaic River existed at the site. The 1909 fire insurance map indicates the property may have been part of the Patton Paint Co., a manufacturer of paints and varnish until at least 1931. However, no buildings were present on the property. One 385-gallon underground storage tank (UST) used for naphtha was located in a parking area, near the eastern border of Building No. 12. Six iron tanks—four 9,500-gallon and two 56,000-gallon—used for storage of turpentine and substitutes and linseed oils, are shown on the 1909 fire insurance map at the location of Building No. 12 (Ref. 6, pp. 22, 46).

The 1931 fire insurance map depicts Building No. 12 and identifies it as a warehouse. The six iron tanks and naphtha USTs are no longer shown on this map. The property appears to have been part of the Pittsburg Plate Glass Co., Paint and Varnish Division until 1973. On the 1973 fire insurance map, factory buildings to the north have been expanded and border the northwest portion of Building No. 12. Two naphtha tanks, assumed to be above ground storage tanks (AST), are still present near the southern border, between Building No. 12 and Building No. 7. Building No. 8 appears to be located at the current location of Building No. 7 (Ref. 6, pp. 22, 43-45).

The 1950 fire insurance map shows that the property as still part of the Pittsburgh Plate Glass Co., Paint and Varnish Division. Building No. 8 is no longer present on this map, and what appears to be the current Building No. 7 has been constructed and is identified as a factory building. Building No. 12 is identified as a warehouse, and the two naphtha tanks are no longer depicted on the property, but are shown on the adjacent property to the south. The ASTs and USTs still appear in the parking area (Ref. 6, pp. 22, 44).

The 1973 fire insurance map indicates the property as part of Universal International Industries. USTs and ASTs are shown (Ref. 6, pp. 22, 43). The 1989 fire insurance map is similar to the 1973; however, Building No. 12 is identified as a warehouse, and Building No. 7 is identified as a factory building (Ref. 6, pp. 23, 42, 43). The 2003 fire insurance map identifies the property as part of the Universal International Industries (Ref. 6, pp. 23, 40).

During a site visit in March 2009, ASTs identified on the fire insurance maps were not observed, and no evidence of USTs in the parking areas was found (Ref. 6, pp. 23, 40). However, ASTs were observed during the site reconnaissance in 2009 on the first and third floors of Building No. 7. Moreover, according the fire insurance maps in Reference 6, up to 11 USTs are possibly present on the property, based on the fire insurance maps (Ref. 6, p. 72). Several areas containing aboveground piping runs were observed at three or more locations on the first floor of Building No. 7 (Ref, 6, pp. 72, 73). The remains of a concrete pad, measuring approximately 120 feet long by 3 feet wide, were observed along the southern side of Building No. 12. One rusted cylinder was observed in this area. Several empty drums were observed on the first floor of Building No. 12. Several 55-gallon drums were observed on the first floor of Building No. 7. Contents of drums were not identified (Ref. 6, p. 73). Two steel grates that covered suspected catch basins were observed inside the southern side of Building No. 7. A trench was observed on the first floor of Building No. 7, approximately 35 feet in length and 4 feet wide (Ref. 6, p. 73). An open pipe was observed on the southern side of Building No. 12. Use and origin of the pipe are unknown (Ref. 6, p. 74). Three pad-mounted transformers were observed within a fenced area near the northeastern corner of Building No. 7. Staining was observed on the grassy area around one of the transformers (Ref. 6, p. 74). Freight elevators were observed in Buildings No. 12 and No. 7. The elevators possibly have hydraulic tanks (Ref. 6, p. 75).

According to an Environmental Data Resources (EDR) report, Jobar Packaging, Inc. occupied Building No. 7 for an unspecified period of time. On September 22, 1988, a spill of approximately 20 pounds of terephthaloyl chloride was reported in Building No. 7. No additional information was provided for this spill. The EDR report identified Building No. 12 as Frey Industries, Inc. Building No. 12 is listed as a Resource Conservation and Recovery Act Treatment, Storage, and Disposal Facility (RCRA-TSDF), with a small quantity generator (SQG) designation. On November 8, 1990, 50 pounds of plastic were spilled at Building No. 12 due to poor housekeeping. No additional information is available (Ref. 6, pp. 76-86).

Based on the site history, the tanks associated with Source 1 that released to the Passaic River and the area of contaminated soil (Source 2) remain from various industrial operations that occurred or are occurring at the former paint and varnish manufacturing facility property.

Riverside Industrial Park Investigations

The EPA removal program conducted removal activities at Riverside Industrial Park at various times from November 13, 2009 through February 28, 2012. The removal actions did not include removal of contaminated soil in Source 2 (Ref. 27). Removal actions included (1) removal of liquids from the basement of buildings; (2) investigations of 10 abandoned 12,000- to 15,000-gallon USTs containing hazardous wastes, approximately 100 3,000- to 10,000-gallon ASTs, and two tanks containing oily wastes in the basement of one of the buildings; (3) soil sampling in the area of USTs; and (4) waste sampling inside the buildings (Ref. 27, pp. 19, 20, 23, 26, 29, 32).

EPA Region 2 requested the EPA – Environmental Response Team (ERT) to conduct a subsurface investigation of a portion at the former paint and varnish manufacturing property in Newark, New Jersey. On May 26 and 27, 2010, ERT collected 24 subsurface soil samples from 12 soil borings (B1 through B12), and collected samples from both above and below the water table (Ref. 38, pp. 1, 2, 6). Twelve ground water samples were collected from the soil borings on May 28, 2010 (Ref. 38, pp. 2, 6). The soil and ground water samples were analyzed for VOCs, SVOCs, and all parameters on the EPA Target Analyte List (TAL). Fill material was encountered at all boring locations. The fill ranges in thickness from 8 to 11.5 feet below land surface (bls), and contains ash and cinder with construction debris such as brick (Ref. 38, p. 2, 3)

All 24 subsurface soil samples collected during the May 2010 ERT investigation contained SVOCs. Some of the prevalent SVOCs in the subsurface soil samples included benzo(a)anthracene (up to 4.9 micrograms per kilogram [mg/kg]), benzo(k)fluoranthene (up to 4.5 mg/kg), benzo(a)pyrene (up to 4.1 mg/kg), and indeno (1,2,3-cd)pyrene (up to 1.9 mg/kg) (Ref. 38, pp. 3, 7, 33 to 57). Lead was detected in 19 of the subsurface soil samples up to a concentration of 4,700 mg/kg (Ref. 38, pp. 9, 10, 69 to 92).

Concentrations of lead were detected in nine of the ground water samples, with a maximum concentration of 16 micrograms per liter (µg/L) (Ref. 38, pp. 3, 10, 127 to 140).

START Region 7 conducted a site removal assessment at Riverside Industrial Park in June 2010 and completed the following tasks during this removal assessment:

- Inventoried and collected liquid and/or residual solid samples from tanks located on the second and third floors of Building 7
- Collected aqueous and sediment samples from the basements of Buildings 7 and 12 where pooled water had accumulated
- Inventoried and sampled drums and containers located on site
- Collected samples of the red- and blue-colored dry pigment materials located on the floor of Building 12
- Collected samples of the tar/resin-like materials leaching from the west bank of the Passaic River and observed along the base of the north wall of Building 7 (Ref. 64, pp. 1, 11, 34).

The samples were analyzed under the Contract Laboratory Program (CLP) for target compound list (TCL) and Toxicity Characteristics Leaching Procedure (TCLP) VOCs, SVOCs, pesticides, and PCBs; and TAL and TCLP metals and cyanide (Ref. 64, p. 11). The sub-basement sediment samples contained VOCs including acetone up to 11,000 micrograms per kilogram (µg/kg); chloroform up to 110,000 µg/kg;

1,3-dichlorobenzene up to 290,000 µg/kg; methylene chloride up to 220,000 µg/kg; 1,1,1-trichloroethane up to 1,100,000 µg/kg; and SVOC 2-methylphenol up to 4,700,000 µg/kg (Ref. 64, pp. 39, 42). The tank wastes contained acetone up to 1,100 µg/kg, methylene chloride up to 560 µg/kg, and xylene up to 630 µg/kg (Ref. 64, p. 35). Resin from the pipes contained ethylbenzene up to 150,000 µg/kg, and m,p-xylenes up to 65,000 µg/kg (Ref. 64, p. 35). Samples were collected from pigments in containers and on the floor. The pigments contained acetone up to 710 µg/kg, methylene chloride up to 300 µg/kg, and lead up to 143 mg/kg (Ref. 64, p. 44). Appendix D of Reference 63 provides sample data summaries for the samples cited above.

From 2008 to 2011, Witman conducted a soil and ground water investigation at lots 62, 66, and 67 of Riverside Industrial Park (Ref. 43, pp. 1-23. Analytical data from the investigations show presence of SVOCs and arsenic (up to 19.6 µg/L) and lead (up to 712 µg/L) in ground water (Ref. 43, pp. 3, 6). The soil samples contained SVOCs (Ref. 43, pp. 8, 16); arsenic, mercury, and lead (Ref. 43, pp. 10, 21); and PCBs (Ref. 43, p. 11).

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Name of source: Spill (from tanks located in the basement of Building 12) Number of source: 1

Source Type: Other

Description and Location of Source (with reference to a map of the site):

On October 29, 2009, the oily content of tanks associated with Source 1 in the basement of Building 12 located at 29 Riverside Avenue, Newark, New Jersey, released into the Passaic River through a connection to a storm sewer. The tanks were connected to the storm sewer by a hose. The valve from the tanks was opened, which caused a release of the contents of the tanks through the hose into the storm sewer and eventually the Passaic River. The probable point of entry (PPE 2) associated with Source 1 is identified in Reference 5; a hose from the tanks in Building 12 is connected to a sewer system which discharged into the Passaic River at PPE 2 (Ref. 5; Ref. 11, pp. 1, 3; Ref. 15, p. 1; Ref. 16, p. 1). The origin of the oil containing hazardous substances in the tanks associated with Source 1 is unknown; however, based on the site history presented in the Introduction Section of this HRS documentation record, the oil (while called oil, it does not refer to petroleum products only) remained from one or more of the various industrial operations conducted on the property.

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

On November 11, 2009, EPA collected a sample from one of the tanks that released into the Passaic River (Ref. 11; Ref. 12; Ref. 16). The analytical results from the tank sample detected the hazardous substances summarized in Table-1 below. The sample included in Table-1 is representative of the contents in both tanks at the site, because the tanks are interconnected by a pipe as photo documented in Reference 13. Although additional compounds (Ref. 12) were identified in the analytical results, those contaminants with highest waste characteristics factor values (see sections 4.1.3.2.1 – Table SW-2 and 4.1.4.2.1 – Table SW-4 of this HRS documentation record) were included in Table-1. As noted on the sample results sheets from the analytical laboratory, the semi-volatiles were analyzed by EPA method 8270; EPA methods 200.7 and 200.8 were used for metals’ analysis (Ref. 12, pp. 3-9).

TABLE-1
TANK SAMPLE (Sample ID: Tank 1)

Analysis	Result (mg/L)	Reporting Limit (mg/L)	Reference
ICP Metals			
Barium	0.59	0.30	12, p. 3
Chromium	0.68	0.050	12, p. 3
Lead	0.014	0.010	12, p. 3
Manganese	3.3	0.020	12, p. 3
Total Mercury			
Mercury	0.012	0.004	12, p. 3
TCL-Semivolatile Organic Compounds			
2,4-Dimethylphenol	16	5	12, p. 4

Notes:

ICP = Inductively coupled plasma
mg/L = Milligrams per liter
TCL = Target compound list

<u>List of Pollutants and Hazardous Substances Associated with Source</u>
Barium
Chromium
2,4-Dimethylphenol
Lead
Manganese
Mercury

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Release via overland migration and/or flood: A release of hazardous substances to the Passaic River (Source 1) is documented; therefore, the containment factor for the surface water migration pathway is assigned a value of 10 (Ref. 1, Table 4-2).

2.4.1 HAZARDOUS SUBSTANCES

2.4.2.1 Hazardous Waste Quantity

2.4.2.1.1 <u>Hazardous Constituent Quantity</u>

The information available is not sufficient to adequately support evaluation of the hazardous constituent quantity (HWQ) for Source 1. The volume of the spill is not known with confidence.

2.4.2.1.2. Hazardous Wastestream Quantity

The source is a release (spill) to the Passaic River. Although some information regarding the source hazardous waste quantity is available, such as an estimated gallons of oil spilled during the emergency spill response in November 2009 (Ref. 14, p. 2), the actual quantity of the release is not adequately documented. Therefore, the hazardous wastestream quantity associated with Source 1 is undetermined but greater than 0, and is assigned a HWQ value of > 0 (Ref. 1, Table 2-5).

TABLE-2
HAZARDOUS WASTESTREAM QUANTITY
SOURCE 1

Hazardous Wastestream	Wastestream Quantity (pounds)	References
Tank contents (see Table 1)	Not quantified	11, pp. 1, 3; 12; 14

Sum (pounds): > 0
Sum of Wastestream Quantity/5,000 (Ref. 1, Table 2-5): > 0

Hazardous Wastestream Quantity Assigned Value: > 0

2.4.2.1.3 <u>Volume</u>

The volume of Source 1 is greater than 0, but the information available is not sufficient to adequately support evaluation of the volume of Source No. 1.

Volume of Source (cubic yards): > 0
Volume Assigned Value: > 0

2.4.2.1.4 <u>Area</u>

The area of Source 1 is greater than 0, but the information available is not sufficient to fully quantify the area of contamination.

Area of Source (square feet): > 0
Area Assigned Value: > 0

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value is greater than 0.

Highest assigned value assigned from Ref. 1, Table 2-5: > 0

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Number of source: 2

Name of source: Contaminated Soils

Source Type: Soil

Description and Location of Source (with reference to a map of the site): Source 2 includes an area of contaminated surface and subsurface soil possibly resulting from the manufacture of paints and varnishes, and other industrial operations between 1909 and 1993 (Ref. 7, pp. 6, 11, 15-16). Among others, a facility inspection conducted by NJDEP in 1987 documented poor waste management practices that may have contributed to the soil contamination at the site (Ref. 71, pp. 3-11). The area of contaminated soil was identified during a sampling investigation by EPA between November 29 and December 2, 2011. The investigation included collection of surface and subsurface soil samples at 15 sampling locations, including three background sampling locations along Riverside Avenue. A surface and subsurface soil sample was collected at each sampling location (Ref. 32, pp. 3, 7, 10). Fill material was used to create land adjacent to the Passaic River and was encountered at all boring locations (Ref. 7, pp. 7, 63; 32, pp. 5, 13, 17).

Regionally, the site is underlain by sandstone strata of Lower Jurassic to Upper Triassic Period Passaic Formation (Ref. 7, p. 6). It is located in a historic fill area; site specific soil profile typically includes fill material from ground surface to depths of approximately 8 to 10 feet below ground surface (bgs) (Ref 7, pp. 7, 63; 32 pp. 5, 13, 17). Materials below the fill include sands, silts, and gravels typical of natural deposits associated with the neighboring Passaic River (Ref. 7, p. 7). The fill contained ash, cinder with construction debris such as brick, and gravel (Ref. 32, p. 13 and Appendix E, p. 105-120). As documented in Tables-5 through Table-18 and Figure 4 of the HRS documentation record, at each sampling location are elevated concentrations of hazardous substances.

The surface and subsurface soil samples were collected from locations where previous industrial site operations had occurred and contamination may have been present¸ as shown on Figures 4 and 5 in Appendix A of Reference 31 (Ref. 31, pp. 17, 34-35) and Figures 3 and 4 of this HRS documentation record. The property was used for manufacturing of paints, varnish, and glass (Ref. 6, pp. 22, 45, 46) and possibly for other activities. Figure 3 of this HRS documentation record shows manufacturing areas and areas where hazardous materials may have been stored. Soil samples were collected near those areas (Ref. 32, p. 24 and Figure 4 of this HRS documentation record). Approximately 21 tanks were located at Riverside Industrial Park. The tanks contained naphtha, turpentine, linseed oil, oil, and unknown liquids (Ref. 32, pp. 4-5; Ref. 61). Figure 3 of this HRS documentation record shows the locations of ASTs, USTs, and buildings formerly located on Riverside Industrial Park (Ref. 31, p. 6; Ref. 7, pp. 51 to 53, 61, 62; Ref. 61). As evidenced by the concentrations of hazardous substances detected in the soil samples collected from Riverside Industrial Park, the former industrial operations on the property released hazardous substances to the soil (see Tables-3 through Table-18 of the HRS documentation record).

As shown in Figure 4 of this documentation record, the sampling locations summarized in Source 2 tables are located within the historic fill area adjacent to the Passaic River (Ref. 32, pp. 34-36). According to eye witnesses, the parcels associated with the Riverside Industrial Park (including areas associated with Source 2), were inundated with water in 2011 (Ref. 72, p. 1, Ref. 84, pp. 1-6). Soil materials associated with Source 2 that contains one or more hazardous substances (as discussed in Section 2.2.2 of this HRS documentation record) is known to have been in contact with surface water through direct deposition. PPE 1 and PPE 3, associated with Source 2, are presented in Reference 5.

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH SOURCE 2

Between November 29 and December 2, 2011, EPA Region 7 START collected 16 surface soil samples (including one duplicate sample). Thirteen of these samples were collected at locations within areas where previous industrial operations had occurred and contamination may have been present at Riverside Industrial Park, as shown on Figure 4, Sampling Location Map of this HRS documentation record (Ref. 32, pp. 9, 10, 24). Three of the sampling locations were outside of any known industrial operation, and thus were selected to document background soil concentrations (Ref. 32, p. 10, Figure 3, p. 23, Figure 4, p. 24). Table 2, page 34, of Reference 32, provides descriptions of the samples. As documented in Tables-5 through Table-18 and Figure 4 of the HRS documentation record, at each sampling location were significantly elevated concentrations of hazardous substances (Ref. 1, Table 2-3).

Surface soil samples were collected in accordance with standard operating procedures described in Reference 31. The soil sample was collected directly into discrete volumetric samplers for VOC analysis. Additional sample volume was collected and homogenized, and then transferred into certified-clean bottleware for analyses for SVOCs, pesticides, PCBs, metals, cyanide, and moisture content. All surface soil samples were screened with a flame ionization detector (FID) and/or photoionization detector (PID) to evaluate the presence of VOCs (Ref. 31, pp. 17 through 20 and Appendix C, pp. 43, 53). Table 2, page 34, of Reference 32 describes the surface soil samples.

The subsurface soil samples were screened with a PID, and any apparent indications of contamination (visual or olfactory) were documented in the boring log along with the PID responses. Samples were collected from recovered soil with an elevated PID response, apparent contamination, or at 11 feet bls (Ref. 31, pp. 17, 18). Table 3 in Reference 32, page 35 provides sample descriptions and sample depths for subsurface soil samples. The descriptions are also provided in the soil boring logs in Appendix E of Reference 32 (Ref. 32, pp. 10, 11; and Appendix E, pp. 105-120). The sample depths can be verified by comparing the sample depths recorded in Table 3 of Reference 32 to the soil boring logs and the PID readings.

PID readings were recorded at the following sampling locations: SB-04 at 8 feet bls at 10 parts per million (ppm); SB-05 at 10 feet bls at 500 ppm; SB-11 at 8 feet bls at 37 ppm; and SB-13 in each interval, with the highest at 4-5 feet bls at 180 ppm (Ref. 32, pp. 10, 102, 103, 104 109, 110, 117, 118). The subsurface soil samples were collected in accordance with standard operating procedures described in Reference 31, Appendix C and pages 10 and 11. Disposable acetate sleeves and disposable sampling equipment were used to minimize cross-contamination (Ref. 32, pp. 10, 11).

Subsurface soil samples were collected directly into discrete volumetric samplers from the acetate sleeve for analysis for VOCs. Additional sample volume from the acetate sleeve was collected and homogenized, and then transferred into certified-clean bottleware for analyses for SVOCs, pesticides, PCBs, metals, cyanide, and moisture (Ref. 32, p. 11).

A photographic documentation log of the investigation is provided in Appendix C, pages 70 through 79 of Reference 32. Copies of the logbook notes are provided in Appendix D, pages 80 through 104 of Reference 32. Logbook notes were recorded in accordance with standard operating procedures (SOP) described in Reference 31, Appendix C. The field soil boring logs are presented in Appendix E page 105, and the chain-of-custody records from the sampling event are provided in Appendix F page 121 of Reference 32. Field soil boring logs were used rather than the logbook to record sample descriptions and sample times/dates (Ref. 32, Appendix E, pp. 106 to 120).

The samples were analyzed under the CLP. Analyses occurred for metals, cyanide, and mercury in accordance with to the EPA CLP Statement of Work (SOW) No. ISM01.2; and for VOCs, SVOCs, pesticides, and Aroclors in accordance with CLP SOW SOM01.2 (Ref. 31, pp. 17, 18, 20). Organic data from sample analyses were validated in accordance with the current SOP HW-35/SVOA (Revision 1) August 2007, EPA Region II Data Validation SOP for SOW SOM01.2; inorganic data were validated using EPA Region 2 SOP HW-2, Revision 13, Appendix A.2, September 2005. The reporting detection limits (RDL) and method detection limits (MDL) are listed on the CLP electronic deliverable documents in References 33 to 37, and 39. The RDLs on the analytical data sheets are the sample-specific and analyte-specific, CLP contract-required quantitation limits (CRQL) (Ref. 40). The sampling and analysis plan (SAP) for the 2011 investigation is in Reference 31. The QAPP is in Reference 59. The data validation reports for the samples are in References 24, 26, 28, 29, 30, 41, 44, and 50 through 57.

During the 2011 investigation, three background surface and subsurface soil samples were collected. Similarities between the background and source samplings include collections using similar sampling procedures (Ref. 31, pp. 17, 18); collections at similar depths as documented in Table-3, Table-4, Table-11, and Table-12; collections at locations with similar topography and land use (Ref. 32, pp. 5, 24, 151-159); collections at locations of similar soil type (historical fill) (Ref. 7, pp. 7, 63; Ref. 31, p. 226; Ref. 32, pp. 34, 35); and analyses via EPA-approved analytical methods (Ref. 31, p. 22).

Table-3 summarizes the locations and descriptions of the background surface soil samples. Table-4 summarizes the locations and descriptions of the surface soil samples collected from Source 2. Table-11 summarizes the locations and descriptions of the background subsurface soil samples. Table-12 summarizes the locations and descriptions of the subsurface soil samples collected from Source 2.

The highest concentrations detected in the background samples (SS-05, SS-06, SS-08, SB-05, SB-06, SB-08) were used to establish the respective background concentrations of the analytes. Concentrations detected in background surface soil samples were compared to source surface soil samples, and concentrations detected in background subsurface soil samples were compared to source subsurface soil samples. Tables-4 through Table-7 list the concentrations of analytes detected in the background surface soil samples. Tables-8 through Table-10 summarize the analytes and their respective concentrations. Tables-13 through Table-15 list the concentrations of analytes detected in the background subsurface soil samples. Tables-16 through Table-18 summarize the analytes and the respective concentrations detected in source subsurface soil samples above background (Ref. 1, Table 2-3).

TABLE-3
BACKGROUND SURFACE SOIL
SAMPLE DESCRIPTIONS

Sample Identification	Sample Date	Sample Time	Sample Depth (inches bls)	Sampling Location	Sample Description	References
RA-SS-05*	11/30/11	1345	0 to 6	Northwest side of Lot 614-1, background sampling location	dark brown, gravelly sand	32, pp. 23, 24, 34, 102, 110; 61; 67, p. 2
RA-SS-06	11/30/11	1520	0 to 6	Lot 614-68, southwest corner, background sampling location	dark gravelly sand (brown/black)	32, pp. 23, 24, 34, 103, 111; 61; 67, p. 2
RA-SS-08	12/01/11	900	0 to 6	Northwest of lot number 614-69, background sampling location	dark brown, black ash like fill with some gravel	32, pp. 23, 24, 34, 103, 113; 61; 67, p. 5

Notes:

*	RA-SS-05 is not used to document background concentrations of VOCs because much of the VOC data for the sample are not usable (Ref. 48, pp. 52, 53)
bls	Below land surface
ft	Feet
RA	Riverside Avenue
SS	Surface soil

TABLE-4
SOURCE No. 2 – SURFACE SOIL
SAMPLE DESCRIPTIONS

Sample Identification	Sample Date	Sample Time	Sample Depth (inches bls)	Sampling Location	Sample Description	Reference
RA-SS-13	12/01/11	1430	0 to 6	Lot 614-63, adjacent to former barrel storage area	brown/black sand clay and ash like fill	32, pp. 23, 24, 34, 67, 104, 118, 129; 61; 67, p. 5
RA-SS-15	12/02/11	1100	0 to 6	Lot 612-61 adjacent to the former storehouse and shipping department	light grey ash like fill	32, pp. 23, 24, 34, 104, 120 129; 61; 67, p. 12

Notes:

bls = Below land surface
RA = Riverside Avenue
SS = Surface soil

TABLE-5
BACKGROUND SURFACE SOIL SAMPLES
VOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (μg/kg)	Q	MDL (μg/kg)	RDL (μg/kg)	Reference
RA-SS-08	B00W4	1,1-Dichloroethene	6.5	U	1.3	6.5	36, p. 12; 32, p. 124; 47, p. 27
RA-SS-08	B00W4	Acetone	13	U	3.6	13	36, p. 12; 32, p. 124; 47, p. 27
RA-SS-08	B00W4	*trans*-1,2-Dichloroethene	6.5	U	0.80	6.5	36, p. 12; 32, p. 124; 47, p. 27
RA-SS-08	B00W4	1,1-Dichloroethane	6.5	U	0.90	6.5	36, p. 12; 32, p. 124; 47, p. 27
RA-SS-08	B00W4	*cis*-1,2-Dichloroethene	6.5	U	0.70	6.5	36, p. 12; 32, p. 124; 47, p. 27
RA-SS-08	B00W4	2-Butanone	13	U	2.5	13	36, p. 12; 32, p. 124; 47, p. 27
RA-SS-08	B00W4	1,1,1-Trichloroethane	6.5	U	0.80	6.5	36, p. 12; 32, p. 124; 47, p. 27
RA-SS-08	B00W4	Trichloroethene	6.5	U	1.5	6.5	36, p. 12; 32, p. 124; 47, p. 27
RA-SS-08	B00W4	Chlorobenzene	6.5	U	1.1	6.5	36, p. 12; 32, p. 124; 47, p. 28
RA-SS-08	B00W4	Styrene	6.5	U	1.0	6.5	36, p. 12; 32, p. 124; 47, p. 28

Notes from Table-5:

μg/kg = Micrograms per kilogram
Conc. = Concentration
ID = Identification
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit (equivalent to a sample quantitation limits [Ref. 40])
SS = Surface soil

Data Qualifiers and Data Validation from Table-5:

The data validation report for the analytical data presented in Table-5 is in References 44 and 54.
U = Non-detect (Ref. 44, p. 1; Ref. 54, p. 1)

TABLE-6
BACKGROUND SURFACE SOIL SAMPLES
SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference
RA-SS-05	B00W1	Phenanthrene	800		59	210	37, p. 42; 32, p. 134; 49, p. 137
RA-SS-05	B00W1	Fluoranthene	750		62	210	37, p. 43; 32, p. 134; 49, p. 137
RA-SS-05	B00W1	Pyrene	530		64	210	37, p. 43; 32, p. 134; 49, p. 137
RA-SS-05	B00W1	Benzo(a)anthracene	270		64	210	37, p. 43; 32, p. 134; 49, p. 137
RA-SS-05	B00W1	Chrysene	260		65	210	37, p. 43; 32, p. 134; 49, p. 137
RA-SS-05	B00W1	Bis(2-ethylhexyl) phthalate	210	U	69	210	37, p. 43; 32, p. 134; 49, pp. 137, 138
RA-SS-06	B00W2	Phenanthrene	1400		53	190	39, p. 14; 32, p. 135; 46, p. 19
RA-SS-06	B00W2	Anthracene	280		52	190	39, p. 14; 32, p. 135; 46, p. 19
RA-SS-06	B00W2	Fluoranthene	2000		57	190	39, p. 14; 32, p. 135; 46, p. 19
RA-SS-06	B00W2	Pyrene	2700		58	190	39, p. 14; 32, p. 135; 46, pp. 19, 20
RA-SS-06	B00W2	Benzo(a)anthracene	1300		58	190	39, p. 14; 32, p. 135; 46, p. 19
RA-SS-06	B00W2	Chrysene	1600		59	190	39, p. 14; 32, p. 135; 46, p. 19
RA-SS-06	B00W2	Bis(2-ethylhexyl) phthalate	770		62	190	39, p. 14; 32, p. 135; 46, p. 19
RA-SS-06	B00W2	Benzo(k)fluoranthene	480		66	190	39, p. 14; 32, p. 135; 46, p. 20
RA-SS-06	B00W2	Benzo(a)pyrene	1100		62	190	39, p. 14; 32, p. 135; 46, p. 20
RA-SS-06	B00W2	Indeno(1,2,3-cd) pyrene	750		58	190	39, p. 14; 32, p. 135; 46, p. 20
RA-SS-08	B00W4	Anthracene	190	U	51	190	39, p. 17; 32, p. 135; 46, p. 30
RA-SS-08	B00W4	Benzo(b) fluoranthene	190	U	78	190	39, p. 17; 32, p. 135; 46, p. 31
RA-SS-08	B00W4	Benzo(k) fluoranthene	190	U	64	190	39, p. 17; 32, p. 135; 46, p. 31
RA-SS-08	B00W4	Indeno(1,2,3-cd) pyrene	190	U	56	190	39, p. 17; 32, p. 135; 46, p. 31

Notes:

µg/kg = Micrograms per kilogram
Conc. = Concentration
ID = Identification
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SS = Surface soil
U =Non-detect

TABLE-7
BACKGROUND SURFACE SOIL SAMPLES
POLYCHLORINATED BIPHENYL (PCB) (ACROCLOR) CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference
RA-SS-05	B00W1	Aroclor-1016	41	U	2.2	36	37, p. 64; 32, p. 134; 49, p. 139
RA-SS-05	B00W1	Aroclor-1221	41	U	6.7	36	37, p. 64; 32, p. 134; 49, p. 139
RA-SS-05	B00W1	Aroclor-1232	41	U	1.1	36	37, p. 64; 32, p. 134; 49, p. 139
RA-SS-05	B00W1	Aroclor-1242	41	U	5.4	36	37, p. 64; 32, p. 134; 49, p. 139
RA-SS-05	B00W1	Aroclor-1248	41	U	2.4	36	37, p. 64; 32, p. 134; 49, p. 139
RA-SS-05	B00W1	Aroclor-1254	41	U	2.7	36	37, p. 64; 32, p. 134; 49, p. 139
RA-SS-05	B00W1	Aroclor-1260	41	U	2.7	36	37, p. 64; 32, p. 134; 49, p. 139
RA-SS-05	B00W1	Aroclor-1262	41	U	12	36	37, p. 64; 32, p. 134; 49, p. 139
RA-SS-05	B00W1	Aroclor-1268	41	U	5.7	36	37, p. 64; 32, p. 134; 49, p. 139
RA-SS-06	B00W2	Aroclor-1016	38	U	2.1	38	39, p. 45; 32, p. 135; 46, p. 16
RA-SS-06	B00W2	Aroclor-1221	38	U	6.2	38	39, p. 46; 32, p. 135; 46, p. 16
RA-SS-06	B00W2	Aroclor-1232	38	U	1.0	38	39, p. 46; 32, p. 135; 46, p. 16
RA-SS-06	B00W2	Aroclor-1242	38	U	4.9	38	39, p. 46; 32, p. 135; 46, p. 16
RA-SS-06	B00W2	Aroclor-1248	38	U	2.2	38	39, p. 46; 32, p. 135; 46, p. 16
RA-SS-06	B00W2	Aroclor-1254	38	U	2.5	38	39, p. 46; 32, p. 135; 46, p. 16
RA-SS-06	B00W2	Aroclor-1260	38	U	2.5	38	39, p. 46; 32, p. 135; 46, p. 16
RA-SS-06	B00W2	Aroclor-1262	38	U	11	38	39, p. 46; 32, p. 135; 46, p. 16
RA-SS-06	B00W2	Aroclor-1268	38	U	5.3	38	39, p. 46; 32, p. 135; 46, p. 16
RA-SS-08	B00W4	Aroclor-1016	36	U	2.0	36	39, p. 46; 32, p. 135; 46, p. 33
RA-SS-08	B00W4	Aroclor-1232	36	U	0.99	36	39, p. 46; 32, p. 135; 46, p. 33
RA-SS-08	B00W4	Aroclor-1242	36	U	4.7	36	39, p. 46; 32, p. 135; 46, p. 33
RA-SS-08	B00W4	Aroclor-1248	36	U	2.1	36	39, p. 48; 32, p. 135; 46, p. 33
RA-SS-08	B00W4	Aroclor-1254	36	U	2.4	36	39, p. 48; 32, p. 135; 46, p. 33
RA-SS-08	B00W4	Aroclor-1260	36	U	2.4	36	39, p. 48; 32, p. 135; 46, p. 33
RA-SS-08	B00W4	Aroclor-1268	36	U	5.0	36	39, p. 48; 32, p. 135; 46, p. 33

Notes:

µg/kg = Micrograms per kilogram
Conc. = Concentration
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SS = Surface soil

Data Qualifiers and Data Validation:

The data validation reports for the analytical data presented in Table-7 are in References 55 and 56.
U = Non-detect

TABLE-8
SOURCE No. 2 – SURFACE SOIL SAMPLES
VOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference
RA-SS-13	B00W9	Styrene	16000		63	390	36, p. 19; 32, p. 125; 47, p. 44

Notes:

µg/kg = Micrograms per kilogram
Conc. = Concentration
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SS = Surface soil

TABLE-9
SOURCE No. 2 – SURFACE SOIL SAMPLES
SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference
RA-SS-15	B00X1	Phenanthrene	8600		530	1900	39, p. 29; 32, p. 136; 46, p. 83
RA-SS-15	B00X1	Anthracene	1500		52	190	39, p. 27; 32, p. 136; 46, p. 83
RA-SS-15	B00X1	Fluoranthene	11000		570	1900	39, p. 29; 32, p. 136; 46, p. 83
RA-SS-15	B00X1	Pyrene	15000		580	1900	39, p. 29; 32, p. 136; 46, p. 83
RA-SS-15	B00X1	Benzo(a)anthracene	6500		580	1900	39, p. 29; 32, p. 136; 46, p. 83
RA-SS-15	B00X1	Chrysene	6800		590	1900	39, p. 29; 32, p. 136; 46, p. 83
RA-SS-15	B00X1	Benzo(k)fluoranthene	2500		66	190	39, p. 27; 32, p. 136; 46, p. 84
RA-SS-15	B00X1	Benzo(a)pyrene	6000		620	1900	39, p. 29; 32, p. 136; 46, p. 84
RA-SS-15	B00X1	Indeno(1,2,3-cd)pyrene	3700		580	1900	39, p. 29; 32, p. 136; 46, p. 84

Notes:

µg/kg = Micrograms per kilogram
Conc. = Concentration
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SS = Surface soil

TABLE-10
SOURCE No. 2 – SURFACE SOIL SAMPLES
POLYCHLORINATED BIPHENYL (PCB) (ACROCLOR) CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference
RA-SS-13	B00W9	Aroclor-1254	410		2.4	36	39, p. 47; 32, p. 135; 46, p. 62

Notes:

µg/kg = Micrograms per kilogram
Conc. = Concentration
ID = Identification
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SS = Surface soil

TABLE-11
BACKGROUND SUBSURFACE SOIL
SAMPLE DESCRIPTIONS

Sample Identification	Sample Date	Sample Time	Sample Depth (feet bls)	Sampling Location	Sample Description	Reference
RA-SB-05	11/30/11	1350	9 to 11	Northwest side of Lot 614-1, background sampling location	soupy clay and sand, brown, black, and red clay	32, pp. 35, 102, 110
RA-SB-06	11/30/11	1535	7 to 8	Lot 614-68, southwest corner, background sampling location	brown sandy clay with gravel	32, pp. 35, 103, 111
RA-SB-08	12/01/11	930	10 to 11	Northwest corner of lot number 614-69, background sampling location	brown silty clay and sand	32, pp. 35, 103, 113

Notes:

ft = Feet
RA = Riverside Avenue
SB = Subsurface soil

TABLE-12
SOURCE No. 2 – SUBSURFACE SOIL
SAMPLE DESCRIPTIONS

Sample Identification	Sample Date	Sample Time	Sample Depth (feet bls)	Sampling Location	Sample Description	Reference
RA-SB-01	11/30/11	945	4 to 7	Lot 614-1, south of former 1931 oil tanks and tank building	6-inch ash fill over 6-inch clay layer, red sand, rocks	32, pp. 35, 106, 122
RA-SB-02	11/30/11	1105	10 to 11	Lot 614-58, near former 1931 oil tanks and tank building	red sand	32, pp. 35, 102, 107, 122
RA-SB-03	11/30/11	1130	10 to 11	Lot 614-70, south of the former lacquer manufacturing building	saturated, mucky, rocky sand	32, pp. 35, 102, 108, 122
RA-SB-04	11/30/11	1255	10 to 11	Lot 614-70, south of the former lacquer manufacturing building, adjacent to the Passaic River	dark brown/black sandy, clay	32, pp. 35, 102, 109, 122
RA-SB-07	11/30/11	1615	6 to 7	Lot 614-68, southeast corner	reddish brown clay and gravel with some cobbles	32, pp. 35, 103, 112, 122
RA-SB-09	12/01/11	1020	4 to 8	Lot 614-70, adjacent to the Passaic River, adjacent to the former manufacturing building	dark brown/black sandy silt, wet	32, pp. 35, 103, 114, 124
RA-SB-10	12/01/11	1045	3 to 4	Lot 614-70, downgradient of the former lacquer manufacturing building	black, white, brown ash like fill, some gravel	32, pp. 35, 103, 115, 124
RA-SB-11	12/01/11	1200	7 to 8	Lot 614-65, downgradient of former turpentine/linseed oil tanks	clay and gravel mix	32, pp. 35, 103, 116, 124
RA-SB-12	12/01/11	1410	8 to 10	Lot 614-64, adjacent to former turpentine/linseed oil tanks	white ash like fill	32, pp. 35, 104, 117, 124
RA-SB-13	12/01/11	1440	4 to 5	Lot 614-63, adjacent to former barrel storage area	brown, black sandy clay	32, pp. 35, 104, 118, 124
RA-SB-14	12/02/11	1020	4 to 5	Lot 614-60, at the location of the former grain silos	brown sandy silt with some lighter ash like fill	32, pp. 35, 104, 119, 134
RA-SB-15	12/02/11	1115	4 to 5	Lot 614-60, adjacent to the former storehouse and shipping department	grey and white and cinder like fill	32, pp. 35, 104, 120, 134

Notes:

bls = Below land surface
RA = Riverside Avenue
SB = Subsurface soil

TABLE-13
BACKGROUND SUBSURFACE SOIL SAMPLES
METALS CONCENTRATIONS

Sample ID	Sample Name	Analyte	Conc. (mg/kg)	Q	MDL (mg/kg)	RDL (mg/kg)	Reference
RA-SB-05	MB00R3	Cadmium	0.61	U	0.034	0.61	34, p. 2; 32, p. 127; 42, p. 12
RA-SB-05	MB00R3	Chromium	11.5		0.064	1.2	34, p. 2; 32, p. 127; 42, p. 12
RA-SB-05	MB00R3	Mercury	0.12	U	0.0040	0.12	34, p. 2; 32, p. 127; 42, p. 10
RA-SB-05	MB00R3	Nickel	9.0		0.047	4.9	34, p. 2; 32, p. 127; 42, p. 12
RA-SB-05	MB00R3	Silver	1.2	U	0.11	1.2	34, p. 3; 32, p. 127; 42, p. 12
RA-SB-06	MB00R4	Arsenic	2.0		0.16	1.2	34, p. 3; 32, p. 127; 42, p. 15
RA-SB-06	MB00R4	Cadmium	0.60	U	0.034	0.60	34, p. 3; 32, p. 127; 42, p. 15
RA-SB-06	MB00R4	Chromium	13.9		0.064	1.2	34, p. 3; 32, p. 127; 42, p. 15
RA-SB-06	MB00R4	Mercury	0.15		0.0040	0.12	34, p. 3; 32, p. 127; 42, p. 14
RA-SB-06	MB00R4	Nickel	9.5		0.047	4.8	34, p. 3; 32, p. 127; 42, p. 15
RA-SB-06	MB00R4	Silver	1.2	U	0.11	1.2	34, p. 3; 32, p. 127; 42, p. 15
RA-SB-08	MB00R6	Arsenic	1.1	U	0.16	1.1	34, p. 4; 32, p. 127; 42, p. 19
RA-SB-08	MB00R6	Cadmium	0.57	U	0.034	0.57	34, p. 4; 32, p. 127; 42, p. 19
RA-SB-08	MB00R6	Chromium	3.6		0.064	1.1	34, p. 4; 32, p. 127; 42, p. 19
RA-SB-08	MB00R6	Mercury	0.11	U	0.0040	0.11	34, p. 4; 32, p. 127; 42, p. 21
RA-SB-08	MB00R6	Nickel	4.6	U	0.047	4.6	34, p. 4; 32, p. 127; 42, p. 19
RA-SB-08	MB00R6	Silver	1.1	U	0.11	1.1	34, p. 4; 32, p. 127; 42, p. 19

Notes:

mg/kg = Milligrams per kilogram
Conc. = Concentration
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SB = Subsurface soil

Data Qualifiers and Data Validation:

The data validation report for the analytical data presented in Table-13 is in Reference 41.

Data Qualifiers (Q):

U = Non-detect

TABLE-14
BACKGROUND SUBSURFACE SOIL SAMPLES
VOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference
RA-SB-05	B00W1	Carbon disulfide	6.7	U	0.70	6.7	33, p. 12; 32, p. 122; 48, p. 17
RA-SB-05	B00W1	Methylene chloride	6.7	U	1.5	6.7	33, p. 12; 32, p. 122; 48, p. 17
RA-SB-05	B00W1	2-Butanone	13	U	2.5	13	33, p. 12; 32, p. 122; 48, p. 17
RA-SB-05	B00W1	1,1,1-Trichloroethane	6.7	U	0.80	6.7	33, p. 12; 32, p. 122; 48, p. 17
RA-SB-05	B00W1	Trichloroethene	6.7	U	1.5	6.7	33, p. 13; 32, p. 122; 48, p. 17
RA-SB-06	B00W2	Carbon disulfide	4.6	U	0.50	4.6	33, p. 16; 32, p. 122; 48, p. 21
RA-SB-06	B00W2	Methylene chloride	4.6	U	1.0	4.6	33, p. 16; 32, p. 122; 48, p. 21
RA-SB-06	B00W2	2-Butanone	9.1	U	1.7	9.1	33, p. 16; 32, p. 122; 48, p. 21
RA-SB-06	B00W2	1,1,1-Trichloroethane	4.6	U	0.60	4.6	33, p. 16; 32, p. 122; 48, p. 21
RA-SB-06	B00W2	Trichloroethene	4.6	U	1.0	4.6	33, p. 16; 32, p. 122; 48, p. 21

Notes:

µg/kg = Micrograms per kilogram
Conc. = Concentration
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SB = Subsurface soil

Data Qualifiers and Data Validation:

The data validation reports for the analytical data presented in Table-14 are in References 44 and 54.

Data Qualifiers (Q):

U = Non-detect (Ref. 54, p. 1; Ref. 44, p. 1)

**TABLE-15
BACKGROUND SUBSURFACE SOIL SAMPLES
SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS**

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference
RA-SB-05	B00R3	Naphthalene	220	U	44	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	2-Methylnaphthalene	220	U	38	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Acenaphthylene	220	U	48	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Acenaphthene	220	U	54	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Fluorene	220	U	54	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Phenanthrene	220	U	61	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Anthracene	220	U	60	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Carbazole	220	U	58	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Di-n-butylphthalate	220	U	56	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Fluoranthene	220	U	65	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Pyrene	220	U	66	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Benzo(a)anthracene	220	U	66	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Chrysene	220	U	67	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Bis (2-ethylhexyl) phthalate	220	U	71	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Benzo(k)fluoranthene	220	U	75	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Benzo(a)pyrene	220	U	71	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Indeno(1,2,3-cd) pyrene	220	U	66	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Dibenzo(a,h)anthracene	220	U	80	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-05	B00R3	Benzo(g,h,i)perylene	220	U	69	220	32, p. 133; 37, pp. 17-18; 49, pp. 31-33
RA-SB-06	B00R4	Naphthalene	200	U	41	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	2-Methylnaphthalene	200	U	35	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Acenaphthylene	200	U	45	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Acenaphthene	200	U	51	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36

**TABLE-15 (Continued)
BACKGROUND SUBSURFACE SOIL SAMPLES
SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS**

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference
RA-SB-06	B00R4	Fluorene	200	U	51	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Phenanthrene	200	U	57	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Anthracene	200	U	55	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Carbazole	200	U	54	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Di-n-butylphthalate	200	U	52	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Fluoranthene	200	U	60	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Pyrene	200	U	61	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Benzo(a)anthracene	200	U	61	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Chrysene	200	U	63	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Bis (2-ethylhexyl) phthalate	200	U	66	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Benzo(k)fluoranthene	200	U	70	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Benzo(a)pyrene	200	U	66	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Indeno(1,2,3-cd)pyrene	200	U	61	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Dibenzo(a,h)anthracene	200	U	75	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-06	B00R4	Benzo(g,h,i)perylene	200	U	64	200	37, pp. 19-20; 32, p. 133; 49, pp. 34-36
RA-SB-08	B00R6	Naphthalene	210	U	41	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	2-Methylnaphthalene	210	U	35	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Acenaphthylene	210	U	45	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Acenaphthene	210	U	51	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Fluorene	210	U	51	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Phenanthrene	210	U	57	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Anthracene	210	U	56	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Carbazole	210	U	55	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47

TABLE-15 (Continued)
BACKGROUND SUBSURFACE SOIL SAMPLES
SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference
RA-SB-08	B00R6	Di-n-butylphthalate	210	U	52	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Fluoranthene	210	U	61	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Pyrene	210	U	62	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Benzo(a)anthracene	210	U	62	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Chrysene	210	U	63	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Bis(2-ethylhexyl) phthalate	210	U	67	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Benzo(k)fluoranthene	210	U	70	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Benzo(a)pyrene	210	U	67	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Indeno(1,2,3-cd)pyrene	210	U	62	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Dibenzo(a,h)anthracene	210	U	75	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47
RA-SB-08	B00R6	Benzo(g,h,i)perylene	210	U	64	210	37, pp. 21-22; 32, p. 133; 49, pp. 45-47

Notes:

µg/kg = Micrograms per kilogram
Conc. = Concentration
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SB = Surface soil

Data Qualifiers and Data Validation (Table-15)

The data validation report for the analytical data presented in Table-15 is in Reference 55.

Data Qualifiers (Q):
U = Non-detect

TABLE-16
SOURCE No. 2 – SUBSURFACE SOIL SAMPLES
METALS CONCENTRATIONS

Sample Identification	Sample Name	Analyte	Conc. (mg/kg)	BK Conc.* (mg/kg)	Q	MDL (mg/kg)	RDL (mg/kg)	Reference
RA-SB-01	MB00T0	Arsenic	8.0	6		0.16	1.4	32, p. 128; 34, p. 8; 42, p. 44
RA-SB-03	MB00R1	Arsenic	70.6	6		0.16	1.9	32, p. 127; 34, p. 1; 42, p. 4
RA-SB-03	MB00R1	Cadmium	3.9	1.83		0.034	0.96	32, p. 127; 34, p. 1; 42, p. 4
RA-SB-03	MB00R1	Chromium	300	41.7		0.064	1.9	32, p. 127; 34, p. 1; 42, p. 4
RA-SB-03	MB00R1	Mercury	3.1	0.45		0.0040	0.38	32, p. 127; 34, p. 1; 42, p. 5
RA-SB-03	MB00R1	Nickel	108	28.5		0.047	7.7	32, p. 127; 34, p. 1; 42, p. 4
RA-SB-03	MB00R1	Silver	4.7	3.6		0.11	1.9	32, p. 127; 34, p. 1; 42, p. 4
RA-SB-04	MB00R2	Arsenic	28.5	6		0.16	1.4	32, p. 127; 34, p. 2; 42, p. 7
RA-SB-04	MB00R2	Cadmium	3.0	1.83		0.034	0.72	32, p. 127; 34, p. 2; 42, p. 7
RA-SB-04	MB00R2	Chromium	166	41.7		0.064	1.4	32, p. 127; 34, p. 2; 42, p. 7
RA-SB-04	MB00R2	Mercury	9.9	0.45		0.0040	0.57	32, p. 127; 34, p. 2; 42, p. 9
RA-SB-04	MB00R2	Nickel	41.5	28.5		0.047	5.7	32, p. 127; 34, p. 2; 42, p. 7
RA-SB-07	MB00R5	Arsenic	9.9	6		0.16	1.3	32, p. 127; 34, p. 3; 42, p. 17
RA-SB-07	MB00R5	Mercury	0.90	0.45		0.0040	0.13	32, p. 127; 34, p. 3; 42, p. 18
RA-SB-09	MB00R7	Arsenic	6.8	6		0.16	1.4	32, p. 127; 34, p. 4; 42, p. 22
RA-SB-09	MB00R7	Cadmium	3.9	1.83		0.034	0.72	32, p. 127; 34, p. 4; 42, p. 22
RA-SB-09	MB00R7	Chromium	122	41.7		0.064	1.4	32, p. 127; 34, p. 4; 42, p. 22
RA-SB-09	MB00R7	Mercury	1.9	0.45		0.0040	0.14	32, p. 127; 34, p. 5; 42, p. 23
RA-SB-09	MB00R7	Nickel	30.4	28.5		0.047	5.7	32, p. 127; 34, p. 5; 42, p. 22
RA-SB-10	MB00R8	Arsenic	7.7	6		0.16	1.2	32, p. 127; 34, p. 5; 42, p. 27
RA-SB-11	MB00R9	Arsenic	16.4	6		0.16	1.4	32, p. 128; 34, p. 5; 42, p. 29
RA-SB-11	MB00R9	Cadmium	4.6	1.83		0.034	0.68	32, p. 128; 34, p. 5; 42, p. 29

TABLE-16 (Continued)
SOURCE No. 2 – SUBSURFACE SOIL SAMPLES
METALS CONCENTRATIONS

Sample Identification	Sample Name	Analyte	Conc. (mg/kg)	BK Conc. (mg/kg)	Q	MDL (mg/kg)	RDL (mg/kg)	Reference
RA-SB-11	MB00R9	Mercury	2.4	0.45		0.0040	0.14	32, p. 128; 34, p. 6; 42, p. 28
RA-SB-12	MB00S0	Arsenic	7.7	6		0.16	1.5	32, p. 128; 34, p. 6; 42, p. 32
RA-SB-12	MB00S0	Cadmium	3.6	1.83		0.034	0.73	32, p. 128; 34, p. 6; 42, p. 32
RA-SB-12	MB00S0	Mercury	2.2	0.45		0.0040	0.15	32, p. 128; 34, p. 6; 42, p. 32
RA-SB-13	MB00S1	Arsenic	9.8	6		0.16	1.3	32, p. 128; 34, p. 7; 42, p. 34
RA-SB-13	MB00S1	Cadmium	23.0	1.83		0.034	0.66	32, p. 128; 34, p. 7; 42, p. 34
RA-SB-13	MB00S1	Chromium	218	41.7		0.064	1.3	32, p. 128; 34, p. 8; 42, p. 34
RA-SB-13	MB00S1	Mercury	3.6	0.45		0.0040	0.27	32, p. 128; 34, p. 8; 42, p. 36
RA-SB-14	MB00S2	Arsenic	6.8	6		0.16	1.9	32, p. 128; 34, p. 7; 42, p. 39
RA-SB-15	MB00S3	Arsenic	6.9	6		0.16	1.2	32, p. 128; 34, p. 7; 42, p. 40
RA-SB-15	MB00S3	Mercury	0.65	0.45		0.0040	0.12	32, p. 128; 34, p. 8; 42, p. 41

Notes:

mg/kg = Milligrams per kilogram
Conc. = Concentration
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SB = Surface soil
* ="BK" represents three times the greatest background concentration. These background concentrations were chosen to establish a significant increase.

TABLE-17
SOURCE No. 2 – SUBSURFACE SOIL SAMPLES
VOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference.
RA-SB-03	B00R1ME	Carbon disulfide	32		90	890	32, p. 122; 33, p. 6; 48, p. 8
RA-SB-03	B00R1ME	2-Butanone	340		340	1800	32, p. 122; 33, p. 6; 48, p. 8

Notes:

µg/kg = Micrograms per kilogram
Conc. = Concentration
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SB = Surface soil

TABLE-18
SOURCE No. 2 – SUBSURFACE SOIL SAMPLES
SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference.
RA-SB-02	B00R0	Naphthalene	4800		67	330	32, p. 133; 37, p. 10; 49, p. 3
RA-SB-02	B00R0	Acenaphthene	570		82	330	32, p. 133; 37, p. 11; 49, p. 4
RA-SB-02	B00R0	Fluorene	870		82	330	32, p. 133; 37, p. 11; 49, p. 4
RA-SB-02	B00R0	Phenanthrene	2900		92	330	32, p. 133; 37, p. 11; 49, p. 4
RA-SB-02	B00R0	Pyrene	470		100	330	32, p. 133; 37, p. 11; 49, p. 4
RA-SB-03	B00R1	Naphthalene	260		41	210	32, p. 133; 37, p. 13; 49, p. 15
RA-SB-03	B00R1	Acenaphthylene	1100		45	210	32, p. 133; 37, p. 13; 49, p. 16
RA-SB-03	B00R1	Acenaphthene	420		51	210	32, p. 133; 37, p. 13; 49, p. 16
RA-SB-03	B00R1	Dibenzofuran	270		52	210	32, p. 133; 37, p. 14; 49, p. 16
RA-SB-03	B00R1	Fluorene	680		51	210	32, p. 133; 37, p. 14; 49, p. 16
RA-SB-03	B00R1	Phenanthrene	7400		290	1000	32, p. 133; 37, p. 15; 49, p. 16
RA-SB-03	B00R1	Anthracene	1300		56	210	32, p. 133; 37, p. 14; 49, p. 16
RA-SB-03	B00R1	Carbazole	690		55	210	32, p. 133; 37, p. 14; 49, p. 16
RA-SB-03	B00R1	Benzo(k)fluoranthene	2500		71	210	32, p. 133; 37, p. 14; 49, p. 17
RA-SB-03	B00R1	Dibenzo(a,h) anthracene	1000		76	210	32, p. 133; 37, p. 14; 49, p. 17
RA-SB-07	B00R5	Fluoranthene	300		66	220	32, p. 133; 37, p. 21; 49, p. 41
RA-SB-09	B00R7	4-Methylphenol	980		41	320	32, p. 133; 37, p. 23; 49, p. 49
RA-SB-09	B00R7	Phenanthrene	330		89	320	32, p. 133; 37, p. 23; 49, p. 50
RA-SB-09	B00R7	Fluoranthene	400		94	320	32, p. 133; 37, p. 23; 49, p. 50
RA-SB-09	B00R7	Pyrene	360		96	320	32, p. 133; 37, p. 23; 49, p. 50
RA-SB-11	B00R9	Fluorene	240		58	240	32, p. 133; 37, p. 26; 49, p. 62
RA-SB-11	B00R9	Phenanthrene	2700		65	240	32, p. 133; 37, p. 26; 49, p. 62
RA-SB-11	B00R9	Anthracene	760		64	240	32, p. 133; 37, p. 26; 49, p. 62

TABLE-18 (Continued)
SOURCE No. 2 – SUBSURFACE SOIL SAMPLES
SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference.
RA-SB-11	B00R9	Benzo(a)anthracene	2500		71	240	32, p. 133; 37, p. 26; 49, p. 62
RA-SB-11	B00R9	Chrysene	2500		72	240	32, p. 133; 37, p. 26; 49, p. 62
RA-SB-11	B00R9	Benzo(k)fluoranthene	900		80	240	32, p. 133; 37, p. 26; 49, p. 63
RA-SB-11	B00R9	Benzo(a)pyrene	2000		76	240	32, p. 133; 37, p. 26; 49, p. 63
RA-SB-11	B00R9	Indeno(1,2,3-cd) pyrene	1300		71	240	32, p. 133; 37, p. 26; 49, p. 63
RA-SB-11	B00R9	Dibenzo(a,h) anthracene	300		86	240	32, p. 133; 37, p. 26; 49, p. 63
RA-SB-11	B00R9	Benzo(g,h,i)perylene	1200		74	240	32, p. 133; 37, p. 26; 49, p. 63
RA-SB-12	B00S0	Phenanthrene	400		67	240	32, p. 133; 37, p. 29; 49, p. 72
RA-SB-12	B00S0	Fluoranthene	560		71	240	32, p. 133; 37, p. 29; 49, p. 72
RA-SB-12	B00S0	Pyrene	450		73	240	32, p. 133; 37, p. 29; 49, p. 72
RA-SB-12	B00S0	Benzo(a)anthracene	260		73	240	32, p. 133; 37, p. 29; 49, p. 72
RA-SB-13	B00S1	Dibenzofuran	270		56	220	32, p. 134; 37, p. 30; 49, p. 76
RA-SB-13	B00S1	Fluorene	330		54	220	32, p. 134; 37, p. 30; 49, p. 76
RA-SB-13	B00S1	Phenanthrene	2400		61	220	32, p. 134; 37, p. 30; 49, p. 76
RA-SB-13	B00S1	Anthracene	460		60	220	32, p. 134; 37, p. 30; 49, p. 76
RA-SB-13	B00S1	Di-n-butylphthalate	2500		56	220	32, p. 134; 37, p. 30; 49, p. 76
RA-SB-13	B00S1	Fluoranthene	2500		65	220	32, p. 134; 37, p. 30; 49, p. 76
RA-SB-13	B00S1	Pyrene	2300		66	220	32, p. 134; 37, p. 30; 49, p. 76
RA-SB-13	B00S1	Benzo(a)anthracene	1400		66	220	32, p. 134; 37, p. 30; 49, p. 76
RA-SB-13	B00S1	Chrysene	1500		67	220	32, p. 134; 37, p. 30; 49, p. 76
RA-SB-13	B00S1	Benzo(k)fluoranthene	520		75	220	32, p. 134; 37, p. 30; 49, p. 77
RA-SB-13	B00S1	Benzo(a)pyrene	1300		71	220	32, p. 134; 37, p. 30; 49, p. 77
RA-SB-13	B00S1	Indeno(1,2,3-cd) pyrene	980		66	220	32, p. 134; 37, p. 30; 49, p. 77

TABLE-18 (Continued)
SOURCE No. 2 – SUBSURFACE SOIL SAMPLES
SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS

Sample ID	Sample Name	Hazardous Substance	Conc. (µg/kg)	Q	MDL (µg/kg)	RDL (µg/kg)	Reference.
RA-SB-13	B00S1	Dibenzo(a,h) anthracene	300		80	220	32, p. 134; 37, p. 31; 49, p. 77
RA-SB-13	B00S1	Benzo(g,h,i)perylene	980		69	220	32, p. 134; 37, p. 31; 49, p. 77

Notes:

µg/kg = Micrograms per kilogram
Conc. = Concentration
MDL = Method detection limit
Q = Data validation qualification
RA = Riverside Avenue
RDL = Reporting detection limit
SB = Subsurface soil

Data Qualifiers and Data Validation:

The data validation report for the analytical data presented in Table-18 is in Reference 55.

<u>List of Hazardous Substances and Pollutants Associated with Source 2:</u>

Acenaphthene
Acenaphthylene
Anthracene
Arsenic
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
2-Butanone
Cadmium
Carbazole
Carbon disulfide
Chromium
Chrysene
Di-n-butylphthalate
Dibenzo(a,h)anthracene
Dibenzofuron
Fluoranthene
Fluorene
Indeno(1,2,3-cd)Pyrene
Mercury
4-Methylphenol
Naphthalene
Nickel
PCB (Aroclor 1254)
Phenanthrene
Pyrene
Silver
Styrene

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

**TABLE-19
CONTAINMENT**

Containment Description	Containment Factor Value	References
Gas release to air:	Not Scored	
Particulate release to air:	Not Scored	
Release to ground water:	Not Scored	
Release via overland migration and/or flood: Source 2 has no engineered cover, or functioning and maintained run-on control system and runoff management system.	10	32, pp. 10, 11, 106 to 120; HRS, Table 4-2

2.4.1 HAZARDOUS SUBSTANCES

2.4.2.1 Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity

The information available is not sufficient to adequately support evaluation of the hazardous constituent quantity for Source No. 2. The number of samples collected was insufficient to represent the concentration of contaminants throughout the source area with confidence.

2.4.2.1.2 Hazardous Wastestream Quantity

The information available is not sufficient to adequately support evaluation of the hazardous waste stream quantity for Source No. 2. The number of samples collected was insufficient to represent the concentration of contaminants throughout the source area with confidence.

2.4.2.1.3 Volume

The information available is not sufficient to adequately support evaluation of the volume for Source No. 2. The number of samples collected was insufficient to represent the concentration of contaminants throughout the source area with confidence.

2.4.2.1.4 Area

The area of soil contamination is estimated to 54,315.34 square feet (ft^2) based on the polygon created by source samples at the site (Ref. 73); this value discounted the footprint of all buildings and paved areas. Source 2 is evaluated as contaminated soil; therefore, it is divided by 34,000 to achieve a hazardous waste quantity value of 1.59 (Ref. 1, p. 51591)

Area: 54,315.34 ft^2
Area Assigned Value (area/34,000): 1.59

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source area HWQ value for Source No. 2 is assigned a value of 1.59 (Ref. 1, Table 2-5).

Source HWQ Value: 1.59
Highest assigned value assigned from Ref. 1, Table 2-5

TABLE-20
SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Hazardous Waste Quantity Value	Source Hazardous Constituent Quantity Complete? (Y/N)	Containment Factor Value by Pathway				
			Ground Water (GW) (Ref. 1, Table 3-2)	Surface Water (SW)		Air	
				Overland/flood (Ref. 1, Table 4-2)	GW to SW (Ref. 1, Table 3-2)	Gas (Ref. 1, Table 6-3)	Particulate (Ref. 1, Table 6-9)
1	>0	N	NS	10	NS	NS	NS
2	1.59	N	NS	10	NS	NS	NS

Notes:

NS = Not Scored

4.0 SURFACE WATER MIGRATION PATHWAY

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

Ground elevation at the property is approximately 6.7 to 12 feet above mean sea level (MSL) and surface water runoff from the site follows the topography and flows east/southeast directly into the river (Ref. 32, pp. 34-36). The northern portion of the property potentially exits into the Passaic River 35 feet south of the northern boundary of lot 69, at the approximate geographic coordinates 40°46'03.11" North latitude and 74°09'27.94" West longitude; this is the most upstream PPE for the site associated with Source 2. The southern portion of the property potentially exits into the Passaic River about 25 feet north of the southern boundary of lot 67, at the approximate geographic coordinates 40°45'53.22" North latitude and 74°09'35.33" West longitude; this is the southernmost PPE for the site associated with Source 2 and the site (Ref. 5; Ref. 70). In addition, PPE associated with Source 1 is depicted in Reference 5. A break wall exists along some of the river boundary (Ref. 86, p. 1).

The Passaic River flows south approximately 2.5 miles, passing Kearny and Harrison, New Jersey on the eastern bank before it makes an abrupt easterly bend for 2 miles, then turns south around Ironbound, and flows directly south for 2 miles; because the river is a tidal surface water body, it also flows north (upstream) for approximately 9.6 miles to Dundee Dam (Ref. 74). At approximately 12 miles downstream of PPE 3, near Ironbound, the TDL extends into the Hackensack River at the northern end of Newark Bay and enters the New York Harbor. Reference 5 depicts the downstream segment of the 15-mile TDL. The Passaic River is tidal where it is adjacent to the Riverside Industrial Park (Ref. 65, p. 1). The approximate mean annual stream flow of the Passaic River as measured from the U.S. Geological Survey (USGS) gauge number 01389890 at the Passaic River at Dundee Dam at Clifton, New Jersey, is 926 cubic feet per second (Ref. 66, p. 3). While there could be tidal carry upstream from the site, insufficient information was available to quantify this possibility.

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/Flood Component

As discussed in Section 4.1.2.1.1, an observed release to surface water by direct observation has been documented. Surface water runoff from the Riverside Industrial Park follows the topography of the land and flows to the Passaic River. Because the soil profile at the Riverside Industrial Park includes disturbed conditions and fill materials underlain by sands, silts, and gravels deposits of the Passaic River , the ground water under the property likely migrates through into the river, after which chemicals enter surface waters or are likely to be sorbed to the river sediments (Ref. 7, p. 7).

4.1.2.1 Likelihood of Release

Two observed releases by direct observation to the Passaic River are documented below.

4.1.2.1.1 Observed Release

<u>Direct Observation</u>

<u>Release 1</u>

On October 29, 2009, two tanks in the basement of Building 12 located at 29 Riverside Avenue in Newark, New Jersey, released to the Passaic River through a connection to a storm sewer. The tanks were connected to the storm sewer by a hose. The valves from the tanks were open, which caused a release of the contents of the tanks through the hose into the storm sewer and eventually into the Passaic River. The PPE associated with Source 1 (PPE 2) is shown in Reference 5 (Ref. 5; Ref. 11; Ref. 15). On November 11, 2009, EPA collected a sample from one of the tanks that released into the Passaic River (Ref. 11; Ref. 12; Ref. 16). Analytical results from the tank sample indicated presence of the hazardous substances listed in Table SW-1 below. The pipe that discharged into the Passaic River was traced to a catch basin. When the cover of the catch basin was removed, the oily substance in the discharge was observed in the basin; a pipe exiting Building 12 was observed to discharge into the basin. The discharge from the Building 12 pipe resembled the discharge observed into the Passaic River. The pipe was traced to two connected tanks in the basement of Building 12 (Ref. 11, pp. 1, 3).

EPA collected a sample from a tank in Building 12 at 29 Riverside Avenue, Newark, New Jersey, that released to a storm sewer and eventually into the Passaic River. The PPE to surface water is shown in Reference 5. The hazardous substances detected in the sample are listed in Table SW-2 below.

TABLE SW-1
OBSERVED RELEASE BY DIRECT OBSERVATION
TANK SAMPLE (Sample ID: Tank 1)

Analysis	Result (mg/L)	Reporting Limit (mg/L)	Reference
ICP Metals			
Barium	0.59	0.30	11; 12, p. 3
Chromium	0.68	0.050	11; 12, p. 3
Lead	0.014	0.010	11; 12, p. 3
Manganese	3.3	0.020	11; 12, p. 3
Total Mercury Waters			
Mercury	0.012	0.004	11; 12, p. 3
TCL – Semivolatile Organics			
2,4-Dimethylphenol	16	5	11; 12, p. 4

Notes:

ICP = Inductively coupled plasma
mg/L = Milligrams per liter
TCL = Target compound list

<u>Release 2</u>

According to eye witnesses, Source 2 was inundated with flood waters in 2011. Although the drainage patterns associated with receding flood waters are unclear, soil materials associated with Source 2 that contain one or more hazardous substances are known to have been in contact with surface water through direct deposition (Ref. 72, p. 1, Ref. 84, pp. 1-6) at some point along the river shore between PPE 1 and PPE 3. PPE 1 and PPE 3, associated with Source 2, are presented in Reference 5 and described in Reference 70. As presented in Tables 8, 9 and 10, surface soil samples associated with Source 2 contain documented concentrations of VOCs, SVOCs and PCBs (see Section 2.2.2 of this HRS documentation record).

<u>Hazardous Substances Released (Source 1 and 2)</u>

Anthracene
Barium
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(k)fluoranthene
Chromium
Chrysene
2,4-Dimethylphenol
Fluoranthene
Indeno(1,2,3-cd)pyrene
Lead
Manganese
Mercury
PCBs (Aroclor-1254)
Phenanthrene
Pyrene
Styrene

Therefore, in accordance with Reference 1, Section 4.1.2.1.1, an observed release factor value of 550 is assigned below and on line 1 of Table 4-1, as a material that contains one or more hazardous substances is known to have been in contact with surface water through direct deposition. Potential to release is not evaluated.

Surface Water Observed Release Factor Value: 550

4.1.3.2 Human Food Chain Threat Waste Characteristics

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

The zone of contamination within the Passaic River is the portion of the Passaic River between PPE 1 and PPE 3 (as shown in Ref. 5). This area represents where the spill occurred and where contaminated flood waters would recede to the normal river boundaries. Table SW-2 summarizes the toxicity/persistence and bioaccumulation factor values for the hazardous substances associated with Source 1 and Source 2 that meet the observed release criteria. The values are assigned in accordance with Section 4.1.2.2.1 of Reference 1. The toxicity/persistence and bioaccumulation values were obtained from Reference 2.

TABLE SW-2
HUMAN FOOD CHAIN TOXICITY, PERSISTENCE, AND BIOACCUMULATION FACTOR VALUES

Hazardous Substance/ Pollutant	Source No.	Toxicity Factor Value	Persistence Factor Value*	Bio-accumulation Value**	Toxicity/ Persistence/ Bioaccumulation Factor Value (Ref. 1, Table 4-16)	References
Acenaphthene	2	10	0.4	500	2.0×10^{3}	2, p. BI-1
Anthracene	2	10	0.4	50000	2.0×10^{5}	2, p. BI-1
Arsenic	2	10000	1	500	5.0×10^{6}	2, p. BI-1
Barium	1	10000	1	500	5.0×10^{6}	2, p. BI-1
Benzo(a)anthracene	2	1000	1	50000	5.0×10^{7}	2, p. BI-2
Benzo(a)pyrene	2	10000	1	50000	5.0×10^{8}	2, p. BI-2
Benzo(k)fluoranthene	2	100	1	5000	5.0×10^{5}	2, p. BI-2
2-Butanone (Methyl ethyl ketone)	2	1	0.4	0.5	2.0×10^{-1}	2, p. BI-8
Cadmium	2	10000	1	50000	5.0×10^{8}	2, p. BI-2
Carbazole	2	10	0.4	500	2.0×10^{3}	2, p. BI-2
Carbon disulfide	2	10	0.4	5	2.0×10^{1}	2, p. BI-3
Chromium	1,2	10000	1	500	5.0×10^{6}	2, p. BI-3
Chrysene	2	10	1	5	5.0×10^{1}	2, p. BI-3
2,4-Dimethylphenol	1	100	1	500	5.0×10^{4}	2, p. BI-5
Dibenzo(a,h)anthracene	2	10000	1	50000	5.0×10^{8}	2, p. BI-4
Di-n-butylphthalate	2	10	1	5000	5.0×10^{4}	2, p. BI-4
Dibenzofuron	2	1000	0.4	500	2.0×10^{5}	2, p. BI-4
Fluoranthene (benzo(j,k)fluorene)	2	100	1	5000	5.0×10^{5}	2, p. BI-2
Fluorene	2	100	1	500	5.0×10^{4}	2, p. BI-6
Indeno(1,2,3-cd) pyrene	2	1000	1	50000	5.0×10^{7}	2, p. BI-8

TABLE SW-2 (Continued)
HUMAN FOOD CHAIN TOXICITY, PERSISTENCE, AND BIOACCUMULATION FACTOR VALUES

Hazardous Substance/ Pollutant	Source No.	Toxicity Factor Value	Persistence Factor Value*	Bio-accumulation Value**	Toxicity/ Persistence/ Bioaccumulation Factor Value (Ref. 1, Table 4-16)	References
Lead	1	10000	1	5000	5.0×10^{7}	2, p. BI-8
Manganese	1	10000	1	50000	5.0×10^{8}	2, p. BI-8
Mercury	1,2	10000	0.4	50000	2.0×10^{8}	2, p. BI-8
4-Methylphenol	2	100	0.0007	5	3.5×10^{-2}	2, p. BI-9
Naphthalene	2	1000	0.4	50000	2.0×10^{7}	2, p. BI-9
Nickel	2	10000	1	500	5.0×10^{6}	2, p. BI-9
Polychlorinated biphenyls (PCB)	2	10000	1	50000	5.0×10^{8}	2, p. BI-10
Pyrene	2	100	1	50000	5.0×10^{6}	2, p. BI-10
Silver	2	100	1	50,000	5.0×10^{6}	2, p. BI-10
Styrene	2	10	0.4	50	2.0×10^{2}	2, p. BI-10

Notes:

* Persistence value for rivers

** Bioaccumulation factor value for brackish water, higher of the salt or freshwater values (Ref. 1, Section 4.1.3.2.1.3; Ref. 17, p. 2-2 and Figure 2-1)

Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^{8}
(*Based on benzo(a)pyrene, cadmium, dibenzo(a,h)anthracene, manganese and PCBs*)

4.1.3.2.2 Hazardous Waste Quantity

Although the HWQ could not be adequately determined, the HWQ value of 100 is assigned to the surface water migration pathway because, as discussed further in Section 4.1.3.3, an observed release to surface water and actual contamination of a sensitive environment at Level II concentrations are documented. If any target for a migration pathway is subject to Level II concentrations, a value of 100 is assigned as the minimum value even if the value obtained from Table 2-6 of Reference 1 is less than 100 (Ref. 1, Section 2.4.2.2).

Hazardous Waste Quantity (HWQ) Factor Value: 100
(Ref. 1, Table 2-6)

4.1.3.2.3 Waste Characteristics Factor Category Value

A waste characteristics product is computed by multiplying the toxicity/persistence factor value by the HWQ factor value (the product of which is subject to a maximum of $1 \text{ x } 10^8$) and then multiplying that number by the bioaccumulation potential factor value. This product (subject to a maximum of $1\text{x } 10^{12}$) is then entered into the HRS Table 2-7 (Ref. 1, p. 51592) to obtain a waste characteristics factor category value. For this site, the toxicity/persistence factor value (10,000) is multiplied by the HWQ value (100). The product of these two values (1×10^6) is multiplied by the bioaccumulation potential factor value (50,000). The product of these two values (5×10^{10}) is used to obtain the waste characteristics factor category value (320) from Table 2-7 of Reference 1.

Toxicity/Persistence Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 100

Toxicity/Persistence Factor Value x
Hazardous Waste Quantity Factor Value: 1×10^6

(Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value) x Bioaccumulation Factor (50,000) Value: 5×10^{10}

Waste Characteristics Factor Category Value: 320
(Ref. 1, Table 2-7 and Section 4.1.3.2.3)

4.1.3.3 Human Food Chain Threat Targets

Actual Human Food Chain Contamination

No fishery is evaluated as being subject to actual contamination. However, an observed release by direct observation of mercury is documented in Section 4.1.2.1.1. As shown in Table SW-3 below, mercury has a bioaccumulation factor value exceeding 500 (Ref. 2, p. BI-8). The zone of contamination within the Passaic River is the portion of the Passaic River between PPE 1and PPE 3 (as shown in Ref. 5).

TABLE SW-3
BIOACCUMULATION FACTOR VALUE SUMMARY

Sample ID	Sample Medium	Distance from PPE	Hazardous Substance	Bioaccumulation Factor Value	References
Tank 1	Waste	0[1]	Mercury	50,000	2, p. BI-8; 12, p. 3

Note:

PPE = Probable point of entry
1 = Because historical documents suggest that sources associated with the site were flooded, the distance from PPE is 0.

4.1.3.3.1 Food Chain Individual

Creel/angler (fishing) surveys were conducted in the area of the observed release by direct observation to surface water (Ref. 5; Ref. 10, pp. 3, 5, 10, 14, 15, 21 74-79; Ref. 74; Ref. 77, pp. 4-19). Studies found that the Passaic River is used for fishing within its target distance limit (TDL) of the property, and that fish caught from the river are consumed despite the fish consumption advisory that has been put in place for the area (Ref. 5; Ref. 10, pp. 7, 8, 9, 10, 33, 38, 44, 55, 56, 57, and 74 through 79; Ref. 19). Several publications substantiate information that the segment of the Passaic River adjacent to the site and downstream is used as a fishery for consumption purposes (Ref. 65, pp. 1-2; Ref. 68, pp. 1-2; Ref. 69, pp. 1-2, 4; Ref. 76, pp. 3-11). No fishery is evaluated as being subject to actual contamination. However, there is an observed release of hazardous substances having a bioaccumulation factor value of 500 or greater to the watershed with a fishery within the 15-mile TDL. Therefore, a food chain individual factor value of 20 is assigned (Ref. 1, Section 4.1.3.3.1; Section 4.1.2.1.1 of this HRS documentation record).

Sample ID: Tank 1 (Ref. 12, p. 3)
Hazardous Substance: Mercury
Bioaccumulation Potential: 50,000

Food Chain Individual Factor Value: 20

4.1.3.3.2.3 Potential Human Food Chain Contamination

The annual production of the Passaic River is unknown; however, active fishing has been documented. It is, therefore, assumed that greater than 0 pounds of fish per year are caught from the river (Ref. 65, pp. 1; 76, pp. 3-11). The potential human food chain contamination factors for the Passaic River are presented below:

Identity of Fishery	Annual Production (pounds)	Type of Surface Water Body	Average Annual Flow (cfs)	Reference	Population Value (P_i)	Dilution Value (D_i)	$P_i \times D_i$
Passaic River	> 0	Moderate to large stream	926	66, pp. 1-3	0.03	0.01	0.0003

Notes:

cfs = Cubic feet per second

Sum of P_i x D_i: 0.0003
(Sum of P_i x D_i)/10: 0.00003

In accordance with Section 4.1.3.3.2.3 of the HRS (Ref. 1, Section 4.1.3.3.2.3), the human food chain population value is multiplied by 0.1.

4.1.4.2 Environmental Threat Waste Characteristics

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

Table SW-4 presents the ecosystem toxicity/persistence factor values for hazardous substances detected in Source 1.

TABLE SW-4
ECOSYSTEM TOXICITY, PERSISTENCE, AND BIOACCUMULATION FACTOR VALUES

Hazardous Substances/ Pollutants	Source No.	Ecosystem Toxicity Factor Value	Persistence Factor Value*	Environmental Bio-accumulation Value**	Ecosystem Toxicity/ Persistence/ Bioaccumulation Factor Value (Ref. 1, Table 4-21)	References
Acenaphthene	2	10000	0.4	500	$2.0x10^{6}$	2, p. BI-1
Anthracene	2	10000	0.4	50000	$2.0x10^{8}$	2, p. BI-1
Arsenic	2	100	1	5000	$5.0x10^{5}$	2, p. BI-1
Barium	1, 2	1	1	500	$5.0x10^{2}$	2, p. BI-1
Benzo(a)anthracene	2	10000	1	50000	$5.0x10^{8}$	2, p. BI-2
Benzo(a)pyrene	2	10000	1	50000	$5.0x10^{8}$	2, p. BI-2
2-Butanone (Methyl ethyl ketone)	2	1	0.4	0.5	$0.2x10^{0}$	2, p. BI-8
Cadmium	2	10000	1	50000	$5.0x10^{8}$	2, p. BI-2
Carbazole	2	1000	0.4	500	$2.0x10^{5}$	2, p. BI-2
Carbon disulfide	2	100	0.4	5	$2.0x10^{2}$	2, p. BI-3
Chromium	2	10000	1	500	$5.0x10^{6}$	2, p. BI-3
Chrysene	2	1000	1	5000	$5.0x10^{6}$	2, p. BI-3
2,4-Dimethylphenol	1	1000	1	500	$5.0x10^{5}$	2, p. BI-5
Di-n-butylphthalate	2	10000	1	5000	$5.0x10^{7}$	2, p. BI-6
Dibenzofuron	2	1000	0.4	500	$2.0x10^{5}$	2, p. BI-4
Fluoranthene (benzo(j,k)fluorene)	2	10000	1	5000	$5.0x10^{7}$	2, p. BI-2
Fluorene	2	1000	1	5000	$5.0x10^{6}$	2, p. BI-2
Lead	2	1000	1	50000	$5.0x10^{7}$	2, p. BI-8
Mercury	1, 2	10000	0.4	50000	$2.0x10^{8}$	2, p. BI-8
4-Methylphenol	2	100	0.0007	5	$3.5 x10^{-1}$	2, p. BI-9
Naphthalene	2	1000	0.4	50000	$2.0x10^{7}$	2, p. BI-9
Nickel	2	1000	1	500	$5.0x10^{5}$	2, p. BI-9
Phenanthrene	2	10000	0.4	50000	$2.0x10^{8}$	2, p. BI-9
Polychlorinated biphenyls (PCB)	2	10000	1	50000	$5.0x10^{8}$	2, p. BI-10
Pyrene	2	10000	1	50000	$5.0x10^{8}$	2, p. BI-10

TABLE SW-4 (Continued)
ECOSYSTEM TOXICITY, PERSISTENCE, AND BIOACCUMULATION FACTOR VALUES

Hazardous Substances/ Pollutants	Source No.	Ecosystem Toxicity Factor Value	Persistence Factor Value*	Environmental Bio-accumulation Value**	Ecosystem Toxicity/ Persistence/ Bioaccumulation Factor Value (Ref. 1, Table 4-21)	References
Silver	2	10000	1	50000	$5.0x10^{8}$	2, p. BI-10
Styrene	2	100	0.4	50	$2.0x10^{3}$	2, p. BI-10

Notes:

* Persistence value for rivers

** Environmental bioaccumulation factor value for brackish water, higher of the salt or freshwater values (Ref. 1, Section 4.1.3.2.1.3; Ref. 17, p. 2-2 and Figure 2-1)

Ecosystem Toxicity/Persistence/Environmental Bioaccumulation Factor Value: 5×10^{8}
(*Based on benzo(a)anthracene, benzo(a)pyrene, cadmium, PCBs, pyrene and silver*)

4.1.4.2.2 Hazardous Waste Quantity

As documented in Section 4.1.4.3 of this HRS documentation record, sensitive environments are subject to actual contamination at Level II concentrations; therefore, a minimum value of 100 is assigned for the HWQ factor value (Ref. 1, Section 2.4.2.2 and Table 2-6).

Hazardous Waste Quantity Factor Value: 100
(Ref. 1, Section 2.4.2.2)

4.1.4.2.3 Waste Characteristics Factor Category Value

A waste characteristics product is computed by multiplying the toxicity/persistence factor value by the HWQ factor value (the product of which is subject to a maximum of 1×10^8) and then multiplying that number by the bioaccumulation potential factor value. This product (subject to a maximum of 1×10^{12}) is then entered into Table 2-7 (Ref. 1) to obtain a waste characteristics factor category value.
For this site evaluation, the waste characteristics factor category value is determined by taking the product of the highest ecosystem toxicity/persistence factor value (10,000) and the HWQ value (100), and multiplying the product by the highest ecosystem bioaccumulation factor value (50,000) (Ref. 1, Section 4.1.4.2.3). Using this product, the waste characteristics factor category value is selected from Table 2-7 of Reference 1.

Ecosystem Toxicity/Persistence Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 100
Ecosystem Toxicity/Persistence Factor Value x
Hazardous Waste Quantity Factor Value: 1×10^6
(Ecosystem Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value) x
Environmental Bioaccumulation Factor Value (50,000): 5×10^{10}

Waste Characteristics Factor Category Value: 320
(Ref. 1, Table 2-7)

4.1.4.3 Environmental Threat Targets

The Passaic River at the location of the observed release by direct observation (PPE) provides migratory pathways and feeding areas critical for the maintenance of anadromous fish species including blueback herring (*Alosa aestivalis*), alewife (*Alosa pseudoharengus*), and American shad (*Alosa sapidissima*). The National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) has designated alewife and blueback herring as species of concern. "Species of concern" specifies threatened species for which insufficient information is available to indicate a need to list the species under the Endangered Species Act (Ref. 5; Ref. 8, p. 2).

Consistent with the HRS Table 4-23, the Passaic River at the location of the direct observation (spills and flooding of the Riverside Industrial Complex parcels, as discussed in Section 4.1.2.1.1 of this documentation record) is included within the New York-New Jersey Harbor Estuary, which was designated an "Estuary of National Significance" in 1988 by EPA, and designated for the maintenance and migration of aquatic life and as an environmentally sensitive area by the State of New Jersey (Ref. 5; Ref. 8, p. 2; Ref. 9). An observed release of hazardous substances having a bioaccumulation potential factor value of 500 or greater to surface water is documented in sections 4.1.2.1.1 and 4.1.4.2.1 of this HRS documentation record.

<u>Most Distant Level II Sample</u>

<u>Source 1</u>
Sample ID: Tank 1 (Ref. 11, pp. 1, 3; Ref. 12; Ref. 14)
Zone of contamination: PPE 1
Distance from the PPE: 0 mile (Ref. 5).

<u>Source 2</u>
Sample ID: RA-SS-13 (Ref. 39, p. 47; Ref. 32, p. 135; Ref. 46, p. 62)
Zone of contamination: Along the Passaic River shoreline between PPE 1 and PPE 3
Distance from the PPE: 0 mile (Ref. 5; Ref. 70; Ref. 72; Ref. 84, pp. 1-6)

4.1.4.3.1 Sensitive Environments

Level II concentrations of contaminants have been documented in the Passaic River. An observed release by direct observation to the river is documented in Section 4.1.2.1.1 of this documentation record (Ref. 1, Section 2.5).

4.1.4.3.1.2 Level II Concentrations

<u>Level II Sensitive Environment Targets</u>

A summary of sensitive environments associated with the Passaic River is provided in Table SW-5. These sensitive environments are subject to Level II concentrations because an observed release by direct observation to the river has been documented. The HRS lists migratory pathways and feeding areas critical for maintenance of anadromous fish species, in waters in which the fish spend extended periods of time, as Sensitive Environments for HRS scoring purposes. A NOAA representative confirmed that the Passaic River adjacent to the Riverside Industrial Park provides migratory pathways and feeding areas critical for the maintenance of anadromous fish species including blueback herring, alewife, and American shad (Ref. 8, p. 2). In addition, a U.S. Fish and Wildlife Service report on habitats in the NY Bight Watershed states that some anadromous fish species spend several months per year in the waters near the site. For example, the blueback herring has a spawning season in this area from April to June, when the fish can be found in fresh or brackish water (Ref. 83, p. 12). American shad spawns from April to June in fresh and brackish water (Ref. 83, p. 12). Therefore, a value of 75 is assigned as per the HRS, Table 4-23.

The HRS lists "Sensitive areas identified under the National Estuary Program" as Sensitive Environments for HRS scoring purposes. These are defined as study areas identified in Comprehensive Conservation and Management Plans as requiring protection because they support critical life stages of key estuarine species in accordance of Section 320 of the Clean Water Act. The New York – New Jersey Harbor Estuary Program's CCMP includes a specific action plan to protect and restore estuarine habitats (Ref. 79, pp. 1-2, 5; Ref. 82, p. 1). The habitat action plan identifies the Hudson Raritan Estuary (HRE) as a Study Area within the larger NY-NJ Harbor Estuary (Ref. 79, pp. 1-2; Ref. 80, p. 22; Ref. 81, pp. 8-18). The location of observed release is within the HRE Study Area. The HRE Study Area requires protection because industrialization and urbanization has impacted the ecological integrity and health of the estuary (Ref. 80, p. 15). In particular, the goals of the HRE include increasing the quantity and quality of benthic habitats supporting fish nursery functions, and promoting stable water masses supporting larval and young fish production (Ref. 81, p. 19). Key estuarine species in the area include the American eel, Atlantic silverside, bluefish, American shad, alewife and winter flounder (Ref. 8, p.2); therefore, consistent with the HRS, Table 4-23, sensitive areas identified under the National Estuary Program, a value of 100 is assigned.

The HRS lists "State-designated areas for protection or maintenance of aquatic life" as a Sensitive Environment for HRS scoring purposes. The area of the Passaic River where the release occurred has been classified by New Jersey as "SE3" which is for the purpose of fishing and fish migration. (Ref. 8, p. 2; Ref. 78, p.12-13) The SE3 designation is one of the State of New Jersey's Surface Water Quality Standards (SWQS) which are in conformance to the federal Clean Water Act. Specifically, the SWQS form the basis of a biannual report to EPA pursuant to Sections 303(d) and 305(b) of the Clean Water Act (Ref. 85, pp. 1-4). Therefore, consistent with the HRS, Table 4-23, a value of 5 is assigned.

TABLE SW-5
LEVEL II SENSITIVE ENVIRONMENTS

Sensitive Environment	**Distance from PPE to Nearest Sensitive Environment**	**References**	**Sensitive Environment Value (Ref. 1, Table 4-23)**
Sensitive areas identified under National Estuary Program	0	8, p. 2; 9	100
Migratory pathways and feeding areas critical for maintenance of anadromous fish species	0	8, p. 2	75
State-designated areas for protection and maintenance of aquatic life	0	8, p. 2	5

Note:

PPE = Probable point of entry

Sum of Level II Sensitive Environments Value: 180

Level II Concentrations Factor Value: 180